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Samuel Owuor

University of Nairobi

Andrea Brown

Wilfrid Laurier University

Jonathan Crush

Balsillie School of International Affairs/WLU, jcrush@wlu.ca

Bruce Frayne

Southern African Migration Programme

Jeremy Wagner

Balsillie School of International Affairs

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THE URBAN FOOD SYSTEM OF NAIROBI, KENYA

THE URBAN FOOD SYSTEM OF NAIROBI, KENYA

SAMUEL OWUOR, ANDREA BROWN, JONATHAN
CRUSH, BRUCE FRAYNE AND JEREMY WAGNER

SERIES EDITOR: PROF. JONATHAN CRUSH

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AUTHORS

Samuel Owuor is Senior Lecturer at the Department of Geography and Environmental Studies, University of Nairobi, Kenya.

Andrea Brown is Associate Professor of Political Science at Wilfrid Laurier University, Waterloo, Ontario, Canada.

Jonathan Crush is CIGI Chair in Global Migration and Development, International Migration Research Centre, Balsillie School of International Affairs, Waterloo.

Bruce Frayne is Director and Associate Professor in the School of Environment, Enterprise and Development, University of Waterloo.

Jeremy Wagner is Research Fellow at the Balsillie School of International Affairs, Waterloo.

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1. CITY BACKGROUND

Nairobi is a city of stark contrasts. Nearly half a million of its three million residents live in abject poverty in some of Africa's largest slums, yet the Kenyan capital is also an international and regional hub boasting an array of embassies, donor organizations and a UN complex in the exclusive residential estate of Gigiri, which is surrounded by high-income suburbs. However, the drama of an under-resourced and poorly managed city reaches into these pockets of wealth and apparent calm. Water, power and telecommunications infrastructure is fragmented and unreliable, and private security companies provide the only buffer between the elite and pervasive violent crime. In Nairobi, the urbanization of poverty is a rapid and ongoing process. At the same time, economic and policy reform is also prominent, suggesting the potential for a more prosperous and sustainable future (APHRC 2014, KNBS 2012c, UN-Habitat 2016).

Nairobi has never been the orderly, planned city envisaged in the colonial Master Plan of 1948 and, while the issues facing the contemporary city are of a much larger scale and of greater complexity than those of the past, it continues its struggle to develop a positive urban system and living environment for all, and especially the urban poor (Jaffer 2013, UN-Habitat 2016). Nairobi has had three eras of development which have all left their imprint on the city today. First, there is the early development of Nairobi under British colonial rule (1899–1962). Second, there is the post-independence period from 1963 to 1999 when Nairobi was growing rapidly and the government was attempting to dismantle the spatial inequities associated with the racial segregation and discrimination that had characterized the colonial period. The final period is that of the modern city, from 2000 to the present. This is the era in which Nairobi has become a truly global African city, and also in which the institutional failures of the past are reflected in the ongoing inability of the state to cope with the city's increasing challenges.

FIGURE 1: Location of Nairobi



Source: http://www.nationsonline.org/maps/kenya_map.jpg

1.1 The Colonial City

The building of the Uganda Railway in the late 19th century, linking the Indian Ocean with the interior, brought a need for a halfway house for workers, warehousing and food supplies. By 1899 the railhead had reached the service post of present-day Nairobi, some 530 kilometres from the port of Mombasa. Nairobi was little more than an informal settlement, comprising 11,500 people in 1906 (UN-Habitat 2006a). Nonetheless, with the railway line reaching Kisumu on Lake Victoria (at that time part of Uganda), the British needed a suitable administrative centre in the region. Being on the new railway line, free of malaria, with a mild climate and adequate water, and flat land for railway sidings and tracks, Nairobi was made the capital of British East Africa by the colonial administration

(Furedi 1973). The railway company also moved its headquarters from Mombasa to Nairobi, spurring the growth of Nairobi as a commercial and business hub of the British East Africa protectorate (Aligula et al 2005a).

Nairobi was a racially segregated settlement from the start, with more than 100 ordinances that distinguished the legal domain in racial terms and a strong social colour bar that pervaded all aspects of life. Africans, Asians and Europeans made up the dominant race groups, living in separate residential areas. The colonial system and nomenclature prevailed, with Africans providing their own housing in “native locations.” Despite the introduction of the Town Planning Ordinance of 1931, Africans lived in largely informal conditions within the native locations, while inadequate land allocation for Africans in general resulted in an ongoing spill-over into squatter settlements on undesignated land (Furedi 1973). The government was unable to enforce the laws that controlled African settlement in urban areas, although the low wage levels ensured that workers could only afford single-room accommodation in the locations (designed for single, male migrants), pushing families and the landless beyond the urban boundary. It was only as a result of labour strikes in Mombasa in 1939 that the colonial government reviewed its policies on urban affairs, and by 1940 the government had begun providing housing for Africans within the city. This coincided with the increase in employment opportunities for women, largely to meet the growing demand for domestic workers in colonial homes, and after 1952 women constituted an important part of the Nairobi African labour force (Furedi 1973).

By the late 1940s, Nairobi’s poorly managed growth was described as “still a jumble, the visitor’s main impression that of a minor Bombay” (Huxley 1948). The British desire for social and spatial order led to a formal town plan through the commissioning of the First Nairobi Master Plan of 1948 (Charton 2005). This plan was comprehensive and included coverage of a wide variety of land uses associated with British and American town planning approaches and systems of development control. As noted by Huxley (1948), the new Master Plan catered for well-to-do Europeans; resident Asians at all income levels; and for a largely single male African labour force of transient migrants, who were assumed to have their real homes elsewhere.

Nairobi continued to develop within the framework of the Master Plan, which had been designed to accommodate a quarter of a million people by 1963. By 1962, one year before independence from Britain, Nairobi’s population was approximately 267,000 (Nairobi City Council 2008, UN-Habitat 2006a). Racial segregation continued to favour Europeans and Asians over Africans, and the city had the social, economic and physical duality typical of colonial cities (Jaffer 2013).

1.2 The Post-Independence City

Immediately after Kenyan independence from Britain in 1963, Nairobi moved to revise the urban planning system to ensure that the city played a central role in achieving the government's non-racial national development priorities. Urban and regional planning systems for Kenya as a whole were developed as complementary policy vehicles for achieving national planning goals (Aligula et al 2005b). The period 1963–1975 was the “era of the structure plan as a means of spatially guiding development” (Aligula et al 2005b) and a time of enhanced agricultural productivity, poverty alleviation and industrial and economic development. The dismantling of urban influx controls and racial labour laws, together with significant economic growth, resulted in rapid urbanization. Nairobi's population grew from some 270,000 in 1963 to more than two million in 1999 (NCC 2008; UN-Habitat 2006a). The period also saw the increased in-migration of women to the city and the normalization of sex ratio for the first time in the history of Nairobi (Muwonge 1980).

In 1968, the Government of Kenya passed the Land Planning Act, which was a re-enactment and amendment of the Development and Use of Land (Planning) Regulations of 1964, with the object of controlling urban land use and development. Within this framework, between 1968 and 1973 a long-term plan was devised for Nairobi, culminating in the 1973 Nairobi Metropolitan Growth Strategy. However, this strategy was poorly implemented and did little to address the needs of the burgeoning poor urban population. During the first decade after independence, employment grew at about 3% per year, which represented approximately 42,000 new jobs. However, the labour force during these years grew at a rate of some 9%, which translated into 172,000 new job seekers. By 1974, the unemployment rate was 44% (House 1984), indicating that high levels of unemployment are not unique to contemporary Nairobi. Although the informal sector grew in response to rising unemployment, the Nairobi City Council did not support this unregulated dimension of the economy, with a consequent lack of services and infrastructure that constrained this entrepreneurial sector's economic development, particularly in the slums.

Official government policy in the post-independence era was to demolish informal settlements in the face of a failure to provide adequate housing for the growing urban population, most of whom had no means of obtaining housing (UN-Habitat 2016, Weru 2004). The main reason for this failure to deliver was wholesale political interference in planning with the result that the “development control machinery virtually collapsed” (Aligula et al 2005b). As an attempted remedy, the Local Authority Development Programme was introduced in 1982 to draw out implementable investment programmes in line with national development goals. However, this did nothing to address the ongoing failure of the town planning system and little was achieved with the 1984–1988 Nairobi City

Commission Development Plan, which outlined the development needs of all sectors in Nairobi (Owuor and Mbatia 2012).

In the 1990s, attempts were made to implement the post-Rio Agenda 21 priorities, which brought the environment into the planning machinery. A further two laws were introduced in an attempt to address the growing development challenges in Nairobi and other urban centres: the Physical Planning Act (1996) and the Environmental Management and Co-ordination Act (1999). In addition, the Local Authority Transfer Fund (1999) was developed to improve funding to local authorities. However, despite the plethora of national and local planning and related legislation, local authorities across the country continued to decline in capacity and resources, and were unable to meet the demand from the urban citizenry effectively. While the Directorate of City Planning was mandated to co-ordinate development activities such as slum upgrading, micro-enterprises and a range of municipal reforms, economic and physical planning was not harmonized with land use or land taxation (UN-Habitat 2006a). A combination of institutional and political factors resulted in a decline in economic growth, environmental degradation, rising unemployment and poverty, insecurity and high crime, poor education and health systems, eroded recreational opportunities, and a highly politicized and corrupt civil service at both local and national levels (Aligula et al 2005b).

1.3 The Modern City

Since 2000, Nairobi's functions "have developed and expanded such that today it has achieved an overwhelming dominance in the political, social, cultural and economic life of the people of Kenya and the whole of the Eastern African region" (Aligula et al 2005a). Nairobi is at the centre of international diplomacy, finance, banking and commerce because of its facilities and position on the African continent. The city is the hub of road, rail and air transport networks, connecting eastern, central and southern African countries. Nairobi employs 25% of Kenyans and 43% of urban workers in the country, generating over 45% of Gross National Product (GNP) (KNBS 2012a, UN-Habitat 2006a). The Nairobi City County, created under the Constitution of Kenya 2010, replaced the Nairobi City Council and operates principally under the Cities and Urban Areas Act and the Devolved Governments Act (Nairobi City County 2017). The spatial extent of the city increased to at least 3,000km² in 2007 (Earth Institute 2008). This growth, within the context of poor economic performance, high population increase and limited institutional capacity, has placed significant pressure on all sectors of the city, including the environment. Nairobi's challenge is therefore significant, particularly in relation to the urban poor.

FIGURE 2: The Nairobi Central Business District

Source: <http://panganga.com/wp-content/uploads/2014/04/editor6564565607503251782-1.jpg>

In 2007, the government unveiled the Kenya Vision 2030. Covering the period 2008 to 2030, this national planning strategy aims at making Kenya a middle-income country that provides high-quality life for all its citizens (Republic of Kenya 2007). It includes five-year plans co-ordinated by the Ministry of Planning and National Development and follows the Economic Recovery Strategy for Wealth and Employment Creation that has been in effect since 2002. The economic aim of the Kenya Vision 2030 is to achieve an average GDP growth rate of 10% per year (Republic of Kenya 2007).

Related to the implementation of Kenya Vision 2030, and in response to the urbanization and development pressures on Nairobi and more broadly in Kenya, the government introduced the Kenya Municipal Programme in 2010, with responsibility for implementation falling to the Urban Development Department of the Ministry of Transport, Infrastructure, Housing and Urban Development. However, this programme has not succeeded as intended and will end in 2017. UN-Habitat (2016a: 1) reports that “currently, the challenges of unplanned urban growth, inadequate infrastructure, affordable low-cost housing, impoverished informal settlements, and increasing urban poverty, among others, have profoundly undermined the path to sustainable urban development. In addition, the urban authorities are highly dysfunctional, characterised by ineffective management and governance and low budgetary allocation for urban development.”

In 2008, the newly created Ministry of Nairobi Metropolitan Development was charged with the development issues of the Nairobi Metropolitan Region.

Aiming at area-wide governance interventions, it released an ambitious Nairobi Metro 2030 as part of the Kenya Vision 2030. The Nairobi Metro 2030 aimed to propel the city into a world-class African metropolis by creating a framework for comprehensively addressing a broad range of policy areas, including the economy, trunk and social infrastructure, transportation, slums and housing, safety and security, and financing (Owuor and Mbatia 2012). Currently, Nairobi’s growth and development is being guided by the Nairobi County Integrated Development Plan 2014, County Annual Development Plan 2017/2018, and the new Nairobi Integrated Urban Development Master Plan (NIUPLAN) 2014–2030. NIUPLAN aims at providing an integrated urban development framework for co-ordinated city development, as well as integrating all sectoral plans and aligning them to Vision 2030.

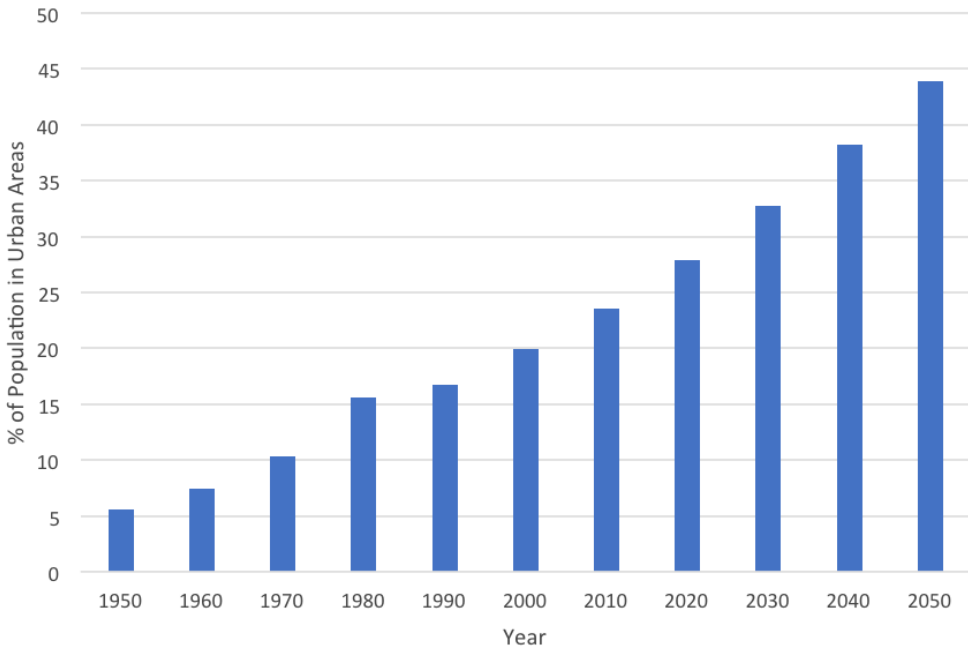
2. DEMOGRAPHY

The country’s fertility rate has dropped to nearly half its 1960 rate of 7.9, with a sustained decrease expected throughout the rest of the century (World Population Review 2017). Kenya’s population is still growing with a national fertility rate of 4.13 (births per woman). Replacement fertility is only expected by the end of this century (Table 1). In addition to a fast-growing population, Kenya is also rapidly urbanizing (Figure 3). Currently, about 30% of Kenya’s population is urban, with an annual growth rate of 4.4%. Table 2 summarizes the intercensal growth rate by region in Kenya. Nairobi’s population is expected to double in 16 years, and triple in 25 years. The population of Nairobi in 2009 was 3.1 million; by 2025 it will be 6.2 million and is projected to reach approximately 10 million by 2038 (KNBS 2010). These demographics represent a significant challenge to Kenya and the governance of the urban economy.

TABLE 1: Population Growth Rate and Projections for Kenya, 1950-2090

Year	Population	% Male	% Female	Growth rate %
1950	6,076,757	50.4	49.6	2.7
1970	11,252,466	49.9	50.1	3.5
1990	23,446,229	49.8	50.2	3.3
2010	40,328,312	50.0	50.0	2.7
2030	65,411,901	49.8	50.2	2.1
2050	95,504,636	49.7	50.3	1.6
2070	125,137,459	49.5	50.5	1.1
2090	148,681,346	49.4	50.6	0.6
Source: World Population Review (2017)				

FIGURE 3: Percentage of Population at Mid-Decade in Urban Areas, 1950-2050



Source: UN (2014)

TABLE 2: Intercensal Growth Rates by Region in Kenya

Province	1969-1979	1979-1989	1989-1999	1999-2009
Nairobi	4.9	4.7	4.8	3.8
Central	3.4	2.8	1.8	1.6
Coast	3.5	3.1	3.1	2.9
Eastern	3.6	3.3	2.1	2.0
North Eastern	4.2	-0.1	9.5	8.8
Nyanza	2.2	2.8	2.3	2.1
Rift Valley	3.8	4.2	3.4	3.6
Western	3.8	3.4	2.8	2.5
Kenya	3.4	3.4	2.9	3.0

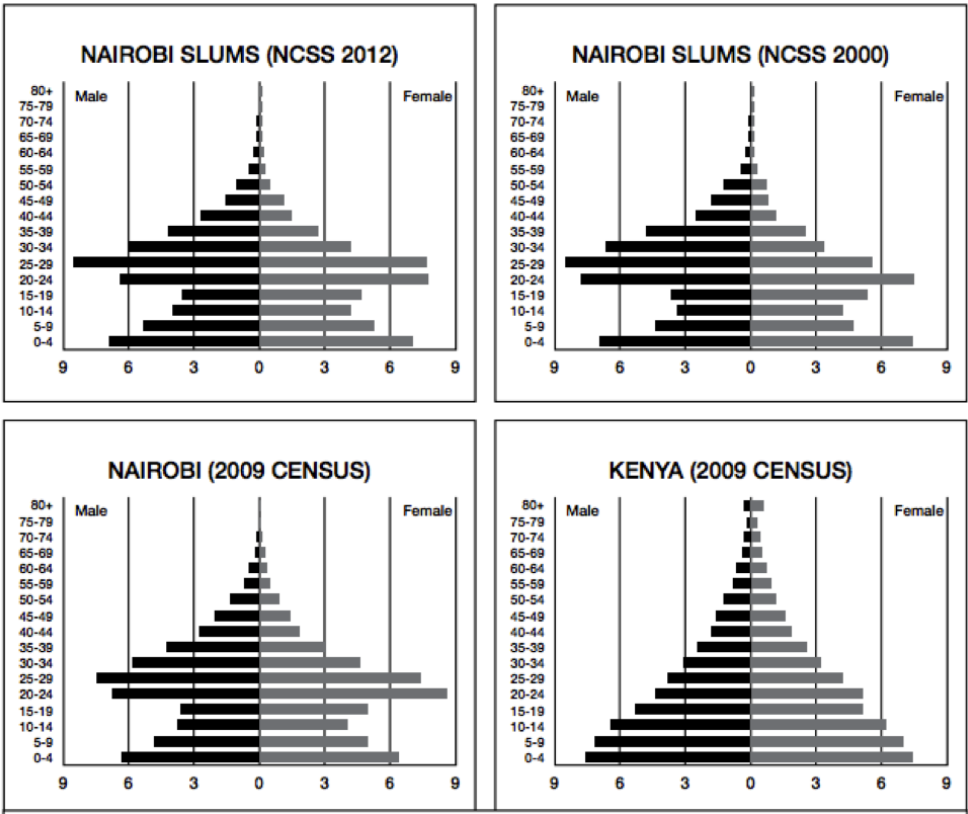
Source: KNBS (2010a)

An estimated 60% of Nairobi’s population lives in slums or informal settlements (APHRC 2014, Rockefeller Foundation 2013). The age profile of the population in informal settlements varies markedly from that of Kenya, and even Nairobi, as whole. First, the proportion of people over the age of 50 is lower in the slums than in the country and the city as a whole. Second, the general youth bulge of people between the ages of 20 and 35 in Nairobi is replicated in the informal settlements, which means that a significant proportion of young people are slum-dwellers (Figure 4). Nairobi attracts a youthful population in search

of economic opportunities through rural-to-urban migration, and regional and international migration. The most recent Kenyan population and housing census data, from 2009, shows that a large percentage of the youth population live in slums (APHRC 2014, KNBS 2013). Third, there is a difference in the composition of the informal area population by sex. There are roughly equal numbers of male and female children, but there are more females than males in the 15–24 age group. In every age group over the age of 25, there are more men than women (UN-Habitat 2013).

The city retains a female and elderly population, particularly among low-income populations. A growing number of elderly people remain in slums, with an annual out-migration rate of only 4% (Falkingham et al 2012). The complexities of Nairobi’s demographics create stress on social service programmes, especially with high levels of unemployment and dependence on precarious livelihoods. Unemployment and weak social service programmes contribute to food insecurity concerns. These factors are exacerbated by rapid urbanization.

FIGURE 4: Population Pyramid of Kenya, Nairobi and Nairobi Slums



Source: APHRC (2014)

As the major economic centre within the region, Nairobi attracts internal migrants as well as economic migrants and refugees from outside Kenya (Arnold et al 2014). Table 3 shows that Nairobi is by far the largest net recipient of migrants in Kenya. Despite a 1990 policy that refugees and asylum seekers should remain in refugee camps, many refugees live in Nairobi (Campbell et al 2011). The UNHCR notes that in 2014 over 50,000 refugees were resident in the city, although the actual number could be much larger since this does not take unregistered refugees into account (UNHCR 2014). The current economic and social state of the country, better income-earning opportunities and access to education, health and other social services are the main reasons behind circular and international migration to Nairobi. Males show a higher out-migration rate and females a higher retention rate in slum settlements (Beguy et al 2010). Additional factors influencing migration to Nairobi include climate change and political instability (ACP 2010, ICMPD and IOM 2012).

TABLE 3: Trends in Recent Migration by Province, 1999-2009

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
In-migrants 1999	341,463	140,299	172,762	118,551	12,750	164,222	287,061	87,747
In-migrants 2009	247,688	135,114	67,849	51,427	7,627	65,577	192,110	44,704
Out-migrants 1999	149,853	118,730	46,988	161,154	17,406	135,730	119,586	141,785
Out-migrants 2009	153,655	109,998	42,008	146,021	14,340	107,220	133,945	104,907
Net in-migrants 1999	191,610	21,569	125,774	-42,603	-4,656	28,492	167,475	-54,038
Net out-migrants 2009	94,033	25,116	25,841	-94,594	-6,713	-41,643	58,165	-60,203
<i>Source: KNBS (2012b)</i>								

In the informal settlements of Nairobi, the proportion of migrants is particularly high. A 2006 survey in Korogocho and Viwandani, for example, found that 86% of the residents were migrants (Emina et al 2011) (Table 4). While there were more male than female residents who were migrants, the difference was less than 5% in both sites and in the aggregate.

TABLE 4: Migrant Population in Korogocho and Viwandani, 2006

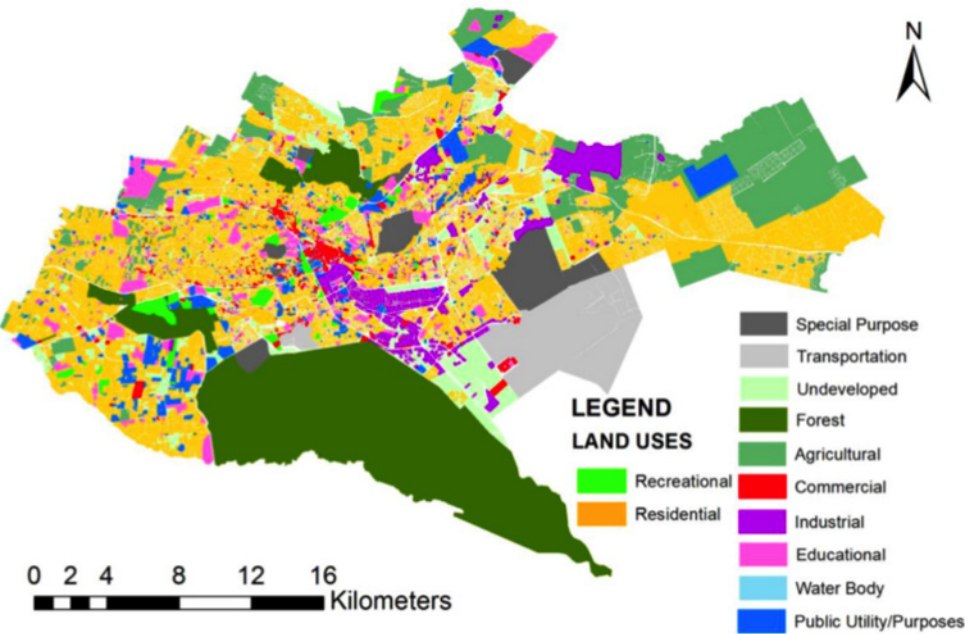
	Korogocho			Viwandani			Both sites		
	Female	Male	Total	Female	Male	Total	Female	Male	Total
Migrant	73.6	76.5	75.2	94.1	95.2	94.8	84.4	87.7	86.3
Non-migrant	26.4	23.5	24.8	5.9	4.8	5.2	15.6	12.3	13.7
<i>Source: Emina et al (2011: S210)</i>									

3. LAND USE AND POPULATION DISTRIBUTION

3.1 Land Use

Nairobi’s built environment consists of the following land uses: residential, commercial, industrial, transportation, educational and public utilities/services (Figure 5). The city boundaries also include recreational, agricultural and undeveloped land, as well as forest and water bodies. Nairobi’s urban landscape can be divided into three types of land tenure, all of which are based on national laws: government land, trust or communal land, and private land (Makachia 2011). Table 5 summarizes trends in land use changes between 1976 and 2000. In this period, land used for agriculture actually increased from 49km² to 88km². The urban and built-up areas have increased from 14km² to 62km². Forested and mixed range lands decreased, due to expanding agriculture and urban sprawl. Recreational areas include the Nairobi National Park, which on its own covers over 18% of Nairobi’s land (Waititu 2007).

FIGURE 5: Nairobi Land Use Map, 2010



Source: Githira (2016)

TABLE 5: Areas of Land Use/Cover Types for Nairobi, 1976-2000

Year	1976		1988		2000	
Land use/ cover classes	Area (km ²)	%	Area (km ²)	%	Area (km ²)	%
Urban areas	13.99	1.90	41.18	5.77	61.23	8.58
Agriculture	49.83	6.98	57.83	8.10	87.78	12.30
Forests	100.15	14.04	29.09	4.08	23.56	3.30
Bushlands	154.48	22.35	101.49	14.22	95.98	13.45
Mixed rangeland	357.32	50.08	340.62	47.74	237.63	33.31
Shrub/brush range	25.22	3.53	64.19	8.99	170.78	23.94
Open/transitional	6.92	0.96	77.96	10.92	32.72	4.58
Water	0.50	0.07	1.09	0.15	3.77	0.53
Total	713.41	100.00	713.44	100.00	713.45	100.00

Source: Mundia and Aniya (2006)

The rate of urban encroachment on other land uses has been rapid with discontinuous patches of urban development characterizing the urban sprawl. As Mundia and Aniya (2006) note, Nairobi shows a characteristic pattern of star-shaped urban sprawl where urban development has evolved along the main transport routes emanating from the city centre. The expansion of settlement has degraded agricultural areas, particularly on the outskirts of the city, as well as converting forests and rangeland (Mundia and Aniya 2006). Urban sprawl is affecting the water supply, wildlife habitat and overall habitat quality, and is leading to serious environmental degradation. Sprawl not only consumes natural habitats but also fragments, degrades and isolates remaining natural areas.

3.2 Population Density

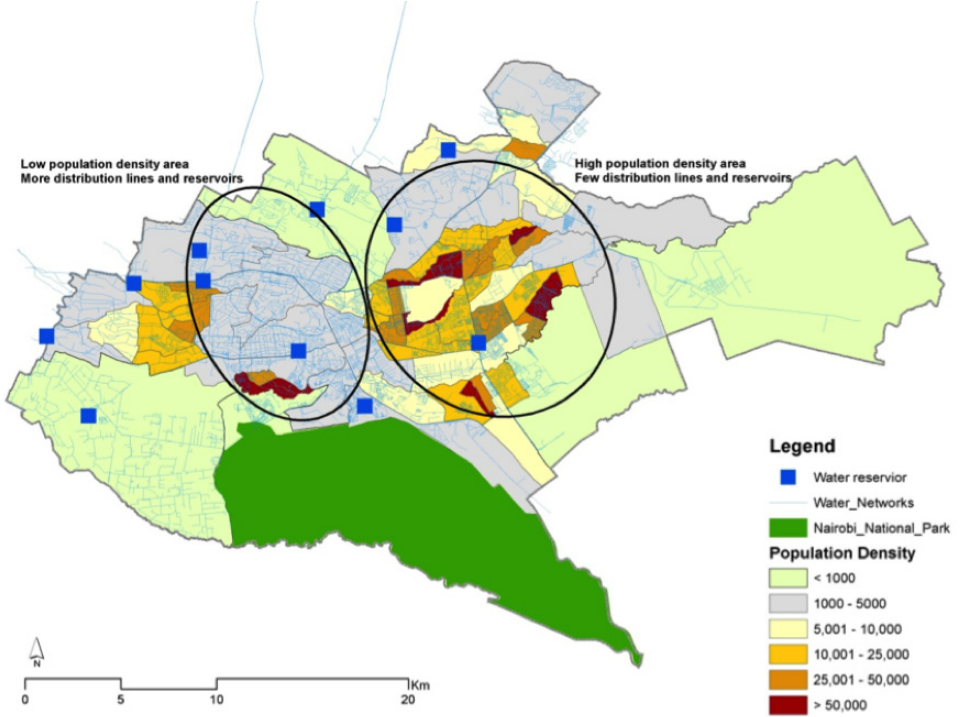
In residential areas, population density varies considerably (Figure 6). The average density is only 31 persons per hectare, with significant variation between the different residential areas (by income) of the city (Table 6). Between 50–60% of Nairobi's population lives on 5–6% of the total land area (Oxfam 2011). In slums, the population density can be up to 2,300 persons per hectare (UN-Habitat 2003). In contrast, in high-income areas, there are spacious residential neighbourhoods with green spaces (Figure 7).

TABLE 6: Population Density by Residential Area, 2006

Area	Income level	Density per hectare
Muthaiga	High	481
Parklands	Medium	2,490
City centre	Low	10,966
Kibera (slum)	Lowest	49,228

Source: UN-Habitat (2006a)

FIGURE 6: Population Density in Nairobi



Source: <http://www.gora4people.org/nairobi.html>

FIGURE 7: Residential Housing Density in Nairobi



Source: University College London, Bartlett Working Paper 159

3.3 Informal Slum Settlements

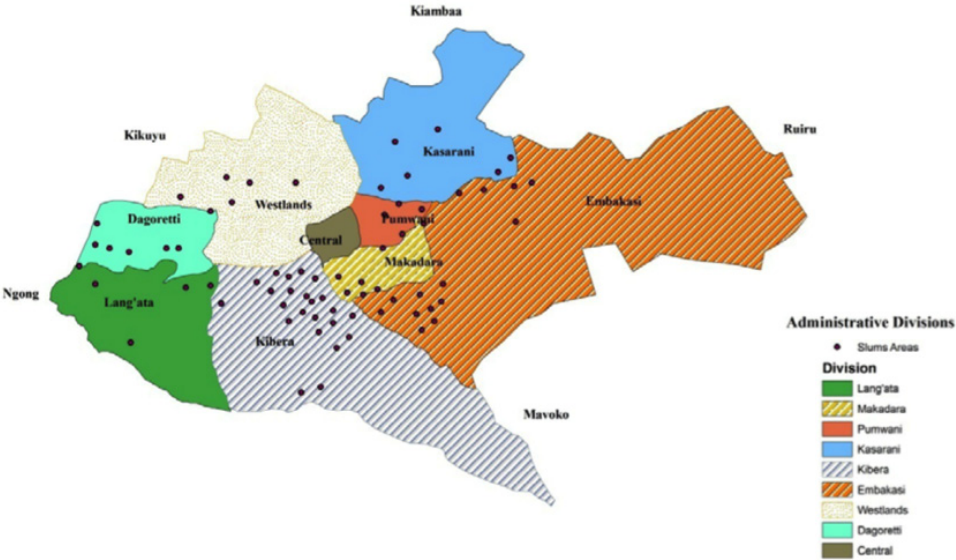
The city's informal settlements cover only 5% of the urban residential land area, yet are home to as many as two-thirds of Nairobi's population. As APHRC (2014) notes, "the consequence of the rapid and uncontrolled population explosion is the proliferation of informal settlements in Nairobi, with between 60 and 70 percent of Nairobi residents estimated to be living in slums." Most slums in Nairobi are of two types: (a) squatter settlements, and (b) illegal subdivisions of government or private land. Makachia (2011) defines these housing types as quasi-legal, illegal and legal housing (Table 7). The distribution of slums in Nairobi is shown in Figure 8. Figures 9 and 10 show the largest slums, Kibera and Mathare Valley, respectively.

TABLE 7: Settlements and Tenure Status

Settlement	Tenure	Tenure system description
Gitara-Marigo	Quasi-legal	Resettlement area for Mukuru dwellers, close to Dandora Site & Service Scheme.
Kangemi-Sodom	Legal	Private land, which was formerly rural Kikuyu (of Kiambu District) homesteads, that was incorporated into the city boundaries through expansion.
Mihang'o	Legal	Private land acquired through a land buying co-operative society and ownership is through share holdings.
Githogoro	Legal/illegal	Mostly privately owned land but some squatting on public land (road reserve). It is located on urban fringe and its development is due to urban sprawl.
Majengo-Pumwani	Quasi-legal	Early "African location", where dwellers were allocated stands using Temporary Occupation Licences. Swahili house typology used in all dwellings.
Mji-wa-Huruma	Illegal	Squatting on public land.
Kibera-Makina	Quasi-legal	Land allocated to Sudanese soldiers who served in the colonial British army. Initially occupied by Nubian of mainly Muslim religious persuasion. Tenants are predominantly from other Kenyan communities.
Mukuru	Illegal	Squatting on public land in areas adjacent to industries and largely multi-ethnic.
Kibera-Soweto East	Illegal	Squatting on public land, largely land invasions and encroachment on railway reserve and other public land. Mainly Luo tenants with Kikuyu slum lords.
Mathare	Quasi-legal	Authorized squatting on public land through populist presidential order. Settlement never legalized but dwellers believe they have the right to inhabit the area even without documentation. Dwellers are mostly Kikuyu.
Native Industrial Training Department	Quasi-legal	Emerged as a labour camp for road construction workers in 1974.
Kaloleni	Legal	CCN rental estate that has been transformed through dwellers' initiatives of extensions of "temporary" dwelling units.

Source: Makachia (2011)

FIGURE 8: Location of Slum Settlements



Source: Mutisya and Yarime (2011)

FIGURE 9: Kibera Slum in Nairobi



Source: http://s2.glbimg.com/z8uE_SmsD-g_gmML59JH1KobwDo=/s.glbimg.com/jo/g1/f/original/2015/02/25/bbc9.jpg

FIGURE 10: Housing in Mathare Valley

Source: <https://frameworks.ced.berkeley.edu/2012/collaborative-planning-in-nairobis-informal-settlements/>

Slums are often located on unsuitable, including polluted, land. The degradation and poor upkeep of land affects the social conditions in which slum dwellers live. For example, due to land degradation, slums areas are unsuitable for certain livelihoods, such as those based on agricultural production. The government recently drafted strategic plans and policies recognizing the existence of slums and the need for improvement, but this does not address the lack of security of tenure or help with access to the most essential social services (Mutisya and Yarime 2011).

Compounding the plight of the poor, city-level land records and development control systems are poorly managed in all housing sectors. This institutional failure has led to large-scale corruption, inequitable land management with a resulting lack of access to land for the politically and economically weak, and generally to slum expansion. Evictions are commonplace in Nairobi, although these have declined since the government's adoption of the Kenya Poverty Reduction Strategy Paper and the UN-Habitat and government housing upgrading partnership (IMF 2010, Weru 2004). With little or no legal recourse if evicted, and with no significant new residential land for low-income housing under development, the urban poor remain locked in crowded and insecure conditions. Recognizing the dire situation in the slums, the government prepared the Housing Bill of 2009, which is expected to become an Act in due course and increase the production of housing units nationally from the current level of 35,000 per year.

4. THE FORMAL ECONOMY

4.1 Economic Activity

Nairobi is the economic heart of Kenya, accounting for 60% of its GDP. Employment and trade are concentrated in the services and manufacturing industries and the agricultural sector, which is the mainstay of the Kenyan economy and accounts for 24% of Nairobi's GDP. Nairobi's service industry (including tourism and communications) is its largest sector, contributing 59% of GDP. Manufacturing of cement, textiles and processed foods is the third-place contributor to the city's GDP. In addition to these primary economic activities, Nairobi engages in some forms of sector diversification, such as infrastructure retrofitting and nuclear energy. Nairobi is connected to Mombasa with a Standard Gauge Railway which is enhancing business investment, tourism and linkages between the two cities, as well as easing congestion of buses along the Nairobi-Mombasa highway.

Nairobi is also a banking and trading hub within East Africa. The Nairobi Securities Exchange stock market is one of Africa's largest stock exchanges, capable of making USD10 million in trade in a day. Most of Kenya's banks have their headquarters in Nairobi and the city is also the headquarters for many international businesses. The Central Business District acts as the economic hub within the city. With many Kenyan business and trade events taking place in Nairobi, the city's revenue is boosted by tourism and travel-related costs. Nairobi also has a growing communications market, including companies such as Safaricom and Airtel Safaricom, which owns the M-PESA system (Ngugi 2011). Africa's largest mobile-phone transfer operator, M-PESA has more than 14,000 agents in Kenya, with more than 40% of these agents in urban areas, and more than 10 million customers. Since 2008, M-PESA users have been able to access banking services through mobile phones (Ngugi 2011).

With 25% of the country's workforce (and 43% of its urban workers) employed in Nairobi, the capital city generates over 45% of the country's GNP (UN-Habitat 2006b). Vision 2030 seeks to boost Nairobi further and ensure it retains its position as the regional and international hub for communication, financial services, manufacturing, education and transport in East Africa (Republic of Kenya 2007). To further Nairobi's global city aspirations, the government signed a telecommunications agreement in 2007 for an undersea survey that would explore the possibility of constructing a fibre-optic cable to the United Arab Emirates to be called the East African Marine Systems. Other fibre-optic cable projects are being pursued to link Kenya to the rest of East Africa and India. The economy is expected to benefit from cheaper internet access prices and improved capac-

ity. Notwithstanding these positive developments, the economic situation in Nairobi has deteriorated much faster than nationally. The proportion of people living below the poverty line in Nairobi doubled in five years from 26% in 1992 to 50% in 1997, and has continued to worsen (Aligula et al 2005a). Recent estimates suggest that more than half of Nairobi residents now live in poverty.

The Kenyan diaspora plays an important role in the city's economy. Not only do migrants return home and boost tourism revenues, but remittance inflows sent home from the Kenya diaspora amounted to 5.4% of Kenya's GDP in 2009, which was more than the private sector raised in capital markets in the same period. As the majority of remittances come from economically stable countries in North America and Europe, this sets up the opportunity for partnership discussions on wider economic issues, such as trade and investment. The creation of Diaspora Trade Councils and business networks facilitates the contracting of diaspora suppliers to exporters (Plaza and Ratha 2011). The knowledge transfer of skilled individuals and return migration help create and sustain Nairobi's public and private institutions.

4.2 Employment and Unemployment

Kenya's labour force increased from 7.3 million in 1989 to 14.2 million in 2009. The number of economically inactive people was estimated at 2.5 million in 1989 and 4.7 million in 2009. Labour force participation rates ranged from 75.7% in 1989 to 76.7% in 2009 (KNBS 2012a). Table 8 shows these rates according to the 2009 Kenya Population and Housing Census.

TABLE 8: Key Indicators in Kenya's Labour Force

	Total %	Male %	Female %
Labour force participation rate	76.7	81.8	71.8
Rural	76.8	80.4	73.3
Urban	76.6	84.1	68.9
Unemployment rate	9.7	9.9	9.4
Rural	7.9	9.0	6.8
Urban	12.8	11.5	14.3
Employment rate	59.3	73.7	65.1
Rural	70.7	73.2	68.3
Urban	66.8	74.4	59.1
Underemployment rate	13.7	10.9	16.8
Rural	16.9	13.7	20.2
Urban	8.0	6.4	10.1
Total dependency ratio	86.9	-	-
Rural	100.4	-	-
Urban	62.7	-	-

Youth (15-30) unemployment rate	13.2	13.6	12.8
Rural	10.6	12.0	9.2
Urban	12.4	16.1	18.8
Youth (15-30) labour force participation rate	67.6	71.1	64.2
Youth employment rate	58.6	61.5	56.0
Rural	60.1	60.9	59.3
Urban	56.2	62.4	50.6
	No. (million)	No. (million)	No. (million)
Employed population (aged 15-64)	14.2	7.4	6.8
Rural	9.3		
Urban	4.9		
Unemployed population (aged 15-64 years)	1.5	0.8	0.7
Rural	0.8		
Urban	0.7		
Economically active (5 years and older)	20.5	10.7	9.8
Rural	14.2		
Urban	6.3		
Working children (aged 5-7)	4.5	2.3	2.2
Rural	3.9		
Urban	0.6		
Employed population (65 years and older)	0.9	0.4	0.5
Rural	0.7		
Urban	0.2		
<i>Source: KNBS (2012a)</i>			

These employment figures include both formal and informal sector employees. However, the disaggregated data shows that 44% of workers were employed in the informal sector (including persons employed in private households) and that the formal sector accounted for only 23% of the working population aged 15-64 (KNBS 2010: xiii). The informal economy therefore dominates employment and plays a critical role in urban livelihoods through employment creation and economic growth, poverty reduction, job training and social protection.

Despite its varied economic structure, formal unemployment rates in Nairobi are high. In 2011, there were an estimated 2.5 million formally unemployed young people in Nairobi, which is well over 50% of the city's population (Oxfam 2011). The Nairobi region has some of the highest youth unemployment and total unemployment rates in the world. Muiya (2014) notes a lack of skills and a lack of education as factors affecting youth unemployment, especially for young women. An opinion survey conducted as part of the Youth and Citizenship Project notes that only 37% of young people say they received formal training for employment (Daily Nation 2014). Many respondents noted employment opportunities lasting only a few days at a time with wages only slightly above USD1 per day (Muiya 2014). Decision-makers have attempted to address youth unemployment

in Nairobi through various stakeholder forums. In 2014, a summit took place for employers and universities in the city (International Conference on the Great Lakes Region 2014). As an outcome of this and other discussions, programmes to overcome unemployment highlight new curricula that help bridge the gap between necessary job skills and long-term and sustainable jobs (Muiya 2014).

A survey of household income-generating activity in two slum areas of Nairobi in 2009 provided various insights into the employment situation in low-income areas of the city (Emina et al 2011) (Table 9). Overall, only 14% of the population over 18 years old were in salaried jobs. There was a major difference between men and women with 22% of males and only 4% of females overall in salaried employment. In Viwandani, the proportion in employment was 22% (33% male and 5% female) due to the proximity of industry. In Korogocho, only 4% of the adult population were in salaried employment (5% male and 2% female). . Casual employment was more common than formal employment in both areas, at 38% in total. As many as 50% of men and 21% of women were in casual jobs. Around one-quarter of women and 18% of men were running their own businesses. The economically inactive population was 27% (which included 51% of the women).

TABLE 9: Income Generating Activity of Adult Population, 2009

	Korogocho			Viwandani			Both sites		
	Female	Male	Total	Female	Male	Total	Female	Male	Total
Salaried employment	1.8	5.1	3.6	5.1	32.6	21.6	3.6	22.3	14.4
Established business	12.1	12.4	12.2	10.2	7.2	8.4	11.0	9.1	9.9
Unestablished business	15.1	13.2	14.1	11.4	6.6	8.5	13.0	9.1	10.7
Casual employment	18.6	54.9	38.1	23.5	46.8	37.5	21.4	49.8	37.8
Economically inactive	51.4	13.6	31.2	49.8	6.8	23.9	50.5	9.3	26.8
<i>Source: Emina et al (2011: S212)</i>									

5. INFORMAL ECONOMY

5.1 Size and Character

The 2009 Kenya Population and Housing Census reported that 53% of the national urban population is engaged in the informal economy, and that this is likely to reflect conditions in Nairobi (KNBS 2012a). In addition, 40% of working children were self-employed in the informal sector. The informal sector is

the most robust employment sector, with nine in every 10 new jobs created being in the informal economy (Budlender 2011). While this data is not disaggregated for Nairobi, earlier data indicated that one-quarter of the city's economy was informal, and it is expected that this proportion has risen over the past decade and a half (Mitullah and Wachira 2003: 5). UN-Habitat (2016: 16) estimates that approximately half of all employed adults in Nairobi are in the informal sector. Moreover, 84% of informal sector employees are youth (15–24 years of age) and more women than men are involved in domestic work and street vending (UN-Habitat 2016: 16; see also Kinyanjui 2013, Muiruri 2010, Thieme 2013). A 2016 national survey of micro, small and medium-sized businesses in Kenya recorded a total of 268,100 licensed and 782,500 unlicensed enterprises in Nairobi (KNBS 2016: 21). Some of the former and all of the latter would qualify as operating in the informal sector.

UN-Habitat (2006b) shows that the informal sector is extremely heterogeneous with a wide variety of activities and work types as well as variable incomes and education levels of participants. There are two major groups of activity in the sector: manufacturing (popularly known as “jua kali”) and services (especially retail). Jua kali artisans are mainly involved in metalworking, hardware and building materials, and repair of vehicles and appliances (Bull et al 2016, Sonobe et al 2011). Jua kali is male-dominated and contributes 15–20% of the informal economy in Nairobi. On the other hand, retail takes place in designated market spaces and on the streets:

They operate on makeshift structures, including mats, tables, racks, wheelbarrows, handcarts and bicycles. Others simply carry their wares in their hands and/or on heads and shoulders. Others hang their goods, such as clothes, on walls, trees or fences. Some are more advanced and have set up temporary shades with stands to display their goods. Most street vendors operate without any formal tenure for the sites they use, nor with formal business names (UN-Habitat 2006b).

Table 10 shows that clothing and shoe retail is the major informal-sector retail activity, with almost half of all vendors involved. Around 12% are involved in selling fresh fruit and vegetables. There is a clear gender difference, with 25% of women and only 6% of men involved in food vending. There are two main types of female entrepreneur in the sector: first, women from surrounding rural areas make regular visits to the city to sell vegetables in the main wholesale market of Wakulima and other small markets. Also, women from further afield come to the city to sell merchandise, including handcrafted baskets, fish and second-hand clothes. Second, many female informal entrepreneurs live in Nairobi and run their businesses in the city's markets and on the streets.

TABLE 10: Types of Informal Sector Retail Activity

	% of informal economy	Male %	Female %
Clothes/bags	48.8	49.4	55.7
Shoes	12.5	16.7	4.7
Vegetables/fruit	12.2	6.2	25.5
Hardware/toys/assorted goods	11.7	12.2	9.4
Electronics	9.9	12.8	-
Utensils	2.0	1.2	0.9
Books	2.0	1.6	-
Cooked food	1.0	-	3.8
<i>Source: UN-Habitat (2006b)</i>			

The informal sector includes workers who hold casual, temporary or multiple jobs, work in subsistence agriculture or illegal business operations, are self-employed and even work unpaid (Ouma 2010a). Also, some formal businesses pay those in the informal sector for service-based work. Activities include transportation, construction, garment or shoe making and trading, metal fabrication, market and street vending and trading, production of household goods, and medicine sales (Kinyanjui 2013). The informal economy also includes financial institutions as few people among the urban poor have access to formal banking services. The average monthly charges for maintaining an account and withdrawal fees make banks inaccessible to the poor and create the need for informal financial services (Ngugi 2011).

Gulyani and Talukdar (2010) randomly sampled 1,755 households in Nairobi's slum settlements to examine their rates of participation in the informal economy. They found that 30% of households operated 632 enterprises that employed 900 people. This would mean that 81,000 slum households operate at least one enterprise and employ 130,000 people. As many as 46% of the micro-enterprises were involved in food retail including sellers of fruit and vegetables, butchers and fishmongers, those preparing and selling snacks and other foods, and those selling household items including cereals. The majority (60%) operate outside the home and half report selling outside their own settlement (Table 11). Households that owned microenterprises were more likely to be poor, to be larger in size, to have more women in the household, and to have previously lived in a rural area. At the same time, microenterprise ownership decreases poverty. The longer the enterprise had been in operation the less likely the household was to be poor. Also, those in the food sector were less likely to be poor than those with enterprises in other sectors.

TABLE 11: Types of Household Microenterprise in Nairobi

Category and types of enterprise	% of enterprises
1. Retailing Selling fruit and vegetables Food preparation, sale and processing Small retailers/hawkers	45.5
2. Clothing and shoes Sewing and textile Shoe making and repair Selling clothes and shows	24.2
3. Retail kiosks Kiosk selling various items Water kiosk	7.9
4. Small fabrication and repairs Furniture making Electronic sales and repair Metal welding/fabrication Automotive repair	7.7
5. Services Dry cleaning, washing, ironing Building, plumbing, electrician, painter Transportation Traditional medicine	4.2
6. Services Hairdresser Medical clinic Photography	4.9
7. Entertainment Brewing Bar	2.3
8. Farming and livestock	0.9
9. Other	2.3
<i>Source: Gulyani and Talukdar (2010: 1714)</i>	

Nairobi is also home to thousands of refugees, especially from the Horn of Africa and the Great Lakes Region (Campbell 2005, 2006, Pavanello et al 2010). Just over 40% are estimated to be self-employed, primarily in the informal economy (Wagacha and Guiney 2008). Since the 1990s, the Eastleigh district of Nairobi has become a major hub for Somali formal and informal business activity (Carrier 2017). Somali refugees in Eastleigh sell a wide variety of goods on the road-sides, including fabrics, undergarments, scarves, shoes, toiletries, crockery, and fruit and vegetables (Pavanello et al 2010). Hundreds of smaller shops, also run mainly by Somalis, sell electronic goods, kitchenware, furniture, clothes and other items. Eastleigh is also home to many Somali-owned telephone call centres and internet cafes (Campbell, 2006). Many musicians and tailors in Nairobi are Congolese refugees, and Ethiopian refugees are successful in the catering and beauty businesses, as well as in running matatus (commuter taxis).

5.2 Informal Sector Policies

The informal economy in Kenya has traditionally been subject to statutes, by-laws and regulations that produce an unfavourable business environment (UN-Habitat, 2006b). Local authorities have used these to control and suppress the development of street vending and other forms of informal trade. This legislation includes the Local Government Act, the Physical Planning Act, the Land Act, the Trade Licensing Act, the Public Health Act, the Employment Act and other employment-related Acts. All have been used in various ways in attempts to control the expansion of the informal sector. The 2012 Micro and Small Enterprises Act was designed to provide a process for the regularization of the informal sector and its absorption into the formal. According to UN-Habitat (2006b), the City of Nairobi (Hawkers) By-Laws 1963 is the main impediment to street trading and other micro-enterprises in Nairobi:

The City Inspectorate has often used these by-laws in order to forcibly to remove informal vendors from the street, where their presence was perceived as an offence. Interestingly, the same by-laws do allow hawking as a licensed activity, but fall short of defining how and where such trade could or should be carried out... Many vendors would readily regularise their informal activities, but are prevented from doing so as much by complex regulations as by lack of support or repressive action by public authorities. Yet for all the wasteful efforts to evict them from public space, most vendors continue to use it illegally (UN-Habitat 2006b).

The sites considered illegal for hawking by city authorities are seen as the most appropriate by hawkers because of their proximity to potential customers (UN-Habitat 2006b). In 2003, the forced relocation of vendors from the open streets pushed them into the backstreets of the Central Business District. In 2006, the City Council updated its by-laws to ban street traders from the CBD (Morange 2015). Over 8,000 vendors are now housed in the government-funded Muthurwa Market outside the CBD (Ouma 2010a). The City Council of Nairobi also allows a weekly Maasai Market to be held in a city parking area (Ouma 2010a). Other markets have developed organically on unoccupied land (Linehan 2015).

The markets certainly do not have the capacity to accommodate all street traders and many still operate on the streets of Nairobi, close to the CBD (IFRA 2016). As Linehan (2015: 327) notes: “poor vendors, with no market space left to trade in, take to the streets, are assaulted by police, arrested, oppressed by taxes, fines, and persistently harassed.” An estimated 14,000 street vendors ply their trade near the CBD where there is constant harassment and conflict with the city authorities:

Between October and December 2012, six street traders were killed by the police as clashes over their presence in the city centre broke down into violence. Their death is the latest sign of a running conflict between the urban poor and the elite. This is a conflict over space, a conflict over ways of life, where the urgencies of livelihoods

sustained by informal trade, clash against the forces of kleptocratic urbanism, and a vision to order Nairobi and build its status as a world class city. As a consequence, the history of street markets in Nairobi is a history of destruction. The needs and rights of these informal workers are not safeguarded by legal or social protections, leading to constant expulsions from the city (Linehan 2015: 325).

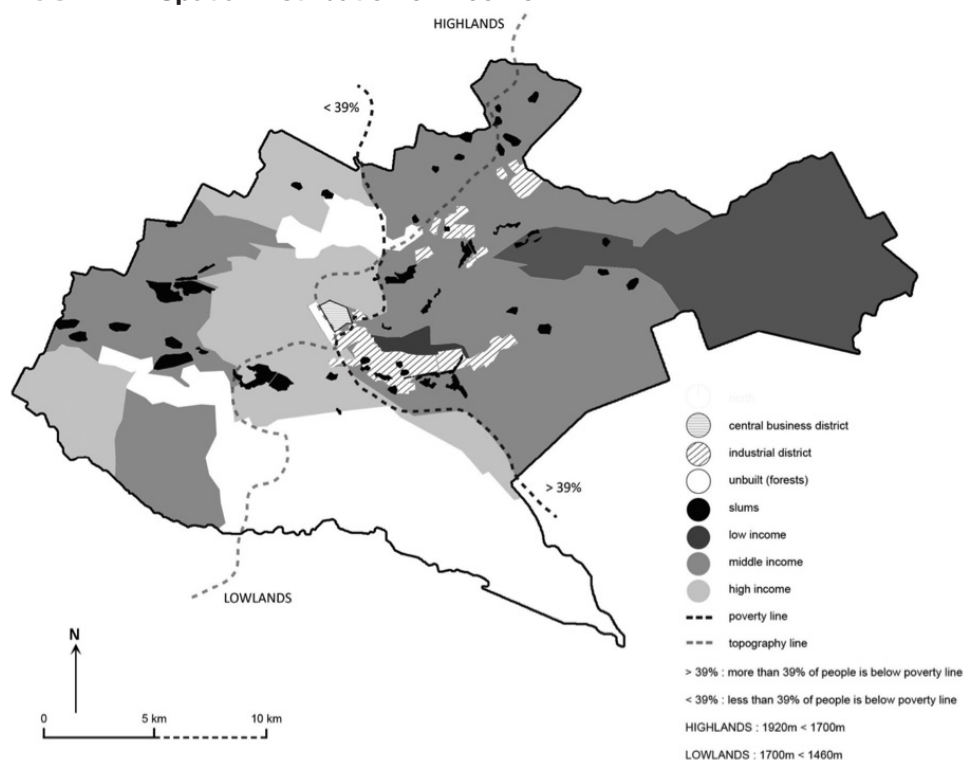
Reports of corruption led to an undercover investigation that revealed widespread and organized intimidation and systematic payment of bribes to city officials. The investigation is portrayed in a four-part documentary series called ‘Kanjō Kingdom.’ As well as probing the governance of street trading, the videos provide a compelling picture of street trading in Nairobi (see <https://www.youtube.com/watch?v=IGMnFQTiwNg>).

6. POVERTY, INCOME AND SERVICES

6.1 Distribution of Income

Nairobi is characterized by high inequality, with a Gini coefficient of 0.46 and with the wealthiest 10% of the city’s population spending 20 times more than the poorest 10% (World Bank 2008). Income distribution across the city is connected to housing distribution and land tenure. High-income neighbourhoods are concentrated in the western part of the city (Figure 11). Civil servants and the middle class reside in medium-density and middle-income neighbourhoods in the eastern quadrant. The low-middle-income population lives in high-density housing estates along major transport routes. The lowest-income areas in Nairobi – except Kibera and a few other informal settlements scattered around the city – form a contiguous area from east of the CBD to the urban fringe of the east quadrant.

Income distribution and expenditure also vary within both low-income and higher-income areas (World Bank 2008). While Nairobi has lower absolute poverty levels than other urban centres in Kenya, poverty is concentrated in the city’s slums. The World Bank (2008: xix) reported that 63% of Nairobi’s slum populations live below the poverty line and that absolute poverty is concentrated in the “slum areas in Nairobi, [which] are home to the bulk of the poor in the country’s capital” (World Bank 2008: 24). Unemployment levels are disproportionately high (26%), and secondary level education or more is low (24%). The World Bank (2008: 56) described living conditions in the slums as “appalling, characterized by widespread poverty and limited or non-existent public services. Housing units in the slums are shabby and crowded, yet rents are high, absorbing a sizeable fraction of household budget.”

FIGURE 11: Spatial Distribution of Income

Source: <https://tem.revues.org/3110>

6.2 Living Conditions in Slums

Sanitary conditions are particularly poor in Nairobi's slums where most residents use pit latrines that are inadequately maintained on poorly graded and drained land (Werna 1998). The consequences are widespread unhygienic conditions with water-borne disease and parasites being a persistent feature of urban life for poor residents (WHO 2008). In addition, Nairobi generates 2,000 tons of refuse daily of which 68% is domestic. Only a small portion is collected from the CBD and the wealthier neighbourhoods, with the latter generally served by the private sector. In some informal areas, NGO and CBO volunteers collect refuse and dispose of it in a central area awaiting collection by the City Council. However, refuse is often dumped in open areas and drainage channels in poor areas, further contributing to the burden of disease experienced disproportionately by the urban poor (Aligula et al 2005b, UN-Habitat 2006a, 2016) (Figure 12).

With regard to energy, Nairobi consumes 50% of the national power generated, using it mainly for lighting. Although 72% of Nairobi's households have access to electricity, only 20% use it for cooking, with about two-thirds (68%) using kerosene and a further 7% using charcoal only. The low level of electricity use reflects the high levels of poverty in the city, with many people unable to afford

the service and consumption costs of electricity. The reliance on carbon fuels contributes to poor respiratory health and has negative consequences for air quality generally. Using kerosene and charcoal also poses an increased domestic fire risk (Weru 2004).

Piped, clean water is unreliable in the most areas of the city, and disproportionately so in the poor areas where reticulated water supply is limited and costly. Inequality in access is striking, with Nairobi's high-income groups (10%) consuming 30% of domestic water, and low-income groups (64%) consuming 35%. Of the 60% of Nairobi's population living in slums, only 22% have water connections (WHO 2000, UN-Habitat 2006a). It is not uncommon for the private sector to fill the water delivery gap in poor areas at prices that are higher than would be the case if the city service was adequate. As many as three-quarters of slum residents buy water from kiosks at a higher cost than middle to higher-income households. Many slum dwellers have limited water for bathing and use polluted river water. Public taps service a mere three percent of slum households. Water supply shortages are commonplace in Nairobi as a result of problems in distribution, waste, illegal connections, overloading and mismanagement (Werna 1998). This means that the poor shoulder the significant cost of the city's failure to deliver water to the low-income and informal areas (Weru 2004).

FIGURE 12: Refuse in Drainage Channel in Slum Area



Source: <http://assets.irinnews.org/s3fs-public/images/201212271216380514.jpg>

Nairobi has a two-tier health care system consisting of state-run hospitals and private medical facilities (Werna 1998). In addition, there are City Council health care facilities. However, even the state and City Council hospitals charge for services on a cost-sharing basis and as a result the poor have limited access to comprehensive health care in the city. Not only is there access differentiation based on ability to pay, but poor communities experience a disproportionate incidence of preventable diseases, the bulk of which are hygiene and nutrition related. For example, the lack of clean water, limited sewerage systems and poor levels of food and nutrition security combine in the high-density informal areas, resulting in a high prevalence of diarrhoea, tuberculosis, and chronic malnutrition, with children disproportionately affected.

In addition to high morbidity rates, living conditions result in higher mortality rates in informal areas compared to middle and high-income areas (Weru 2004). Rates of HIV and AIDS are higher in Nairobi than rural areas, and urban poverty and associated survival activities may place the urban poor at greater risk of contracting the virus. In addition, access to treatment and care is more difficult for the urban poor than for the middle and high-income groups, although the government's co-ordinated AIDS prevention and treatment programme has seen a significant reduction in HIV prevalence rates at the national level (AfDB and OECD 2008).

6.3 Education

Nairobi is a national centre for all levels of education. School attendance ratios are high except among girls and the poor. Nairobi's slums in particular are underserved at all levels, and many schools are informal and not registered with the government as educational institutions. As Table 12 indicates, levels of attendance vary significantly between the poor areas and the city average, especially for secondary school, with attendance rates disproportionately low among girls. While basic education is free (Free Primary Education Programme) and there is a plan to offer free secondary school tuition, large numbers of poor children in Nairobi remain outside the education system.

TABLE 12: School Attendance in Nairobi by Location and Gender, 2006

Gender	Nairobi slums		Nairobi average	
	Primary	Secondary	Primary	Secondary
Male	77	31	89	73
Female	72	33	76	50

Source: UN-Habitat 2006a

7. URBAN FOOD SYSTEM

7.1 Food Supply

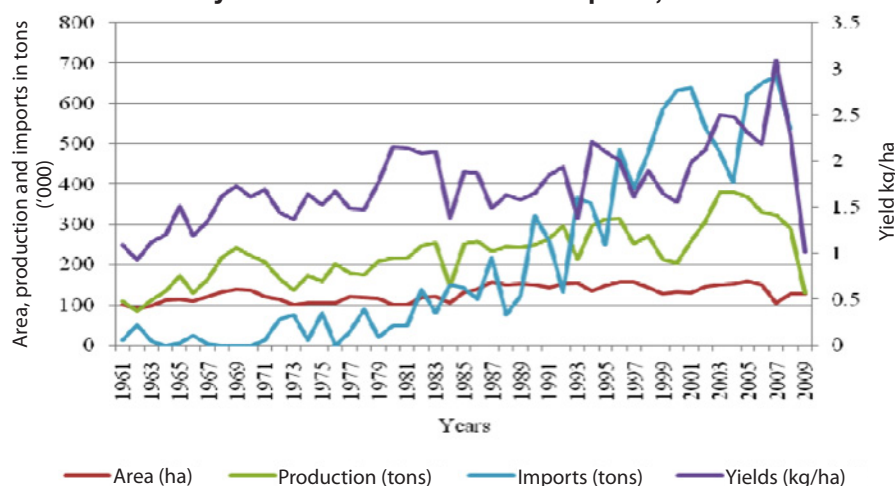
In East Africa, rapid urbanization is stretching existing food and agriculture systems as growing cities struggle to provide food and nutrition security for their inhabitants. Nairobi is no exception; it is a dynamically growing city and its food supply chains are constantly adapting and responding to changing local conditions. Nairobi is also an international city and the extent to which it is food secure is increasingly predicated on food imports from the regional East African Community and other international sources. Informal traditional value chains have a variety of actors and intermediaries that increase transaction costs and create an inefficient post-harvest procurement network, thereby pushing food products out of the reach of those who need them most. Nairobi's formalized food system is growing and relies on centralized and regionalized procurement networks, specialized wholesalers and supplier systems, and modern retailing outlets that seek competitive advantage through direct control of their procurement systems. This is creating a fundamental structural change in agri-food supply chains for Nairobi and the East African region generally.

The domestic food supply chain system in Kenya is the backbone of the economy, with the agricultural sector contributing 26% of national GDP (Ministry of Agriculture 2015). The main food crops in Kenya are maize, wheat, beans, peas, bananas and potatoes, with cereals grown in the largest quantity. Cereal production is the most substantial sub-sector of the agricultural economy, with 2.7 million ha of land under cultivation. Maize is the most important agricultural product in Kenya with a cultivated area of 2.1 million ha and 3.7 million tons produced in 2014 (Ministry of Agriculture 2015). It is grown by 98% of smallholders in the country and the overall production is highly concentrated, with less than 3% of the farms accounting for 50% of all the maize sold from the smallholder sector (Jayne et al 2008; Kirimi et al 2011). In 2014, 147,000ha were under wheat and 28,000ha under rice.

Over the years, Kenya has had a structural deficit in all three primary staple cereals – maize, wheat and rice. This is partially due to shifting food preferences and an increase in the per capita consumption of wheat and rice. The percentage growth rate of per capita consumption of wheat in Kenya was 1.2% between 1995 and 2008, with the annual consumption of rice increasing at a rate of 12% over the same period (Gitau et al 2011). Figure 13 shows that for wheat, the area under cultivation, overall production and yields have not increased significantly since the 1960s. Imports of wheat have increased from close to zero in the late 1960s to 600,000 tons in 2009. In the mid-1990s, imports of wheat exceeded

domestic production for the first time. Kenya usually imports maize from Uganda and Tanzania. It imports over 60% of the wheat that is consumed nationally, mostly from Argentina, the United States, Ukraine and Russia. Although rice is now a major staple in Kenya's urban areas, only a small amount is produced in the country (Ariga et al 2010).

FIGURE 13: Kenyan Wheat Production and Imports, 1961-2009



Source: Gitau et al (2011)

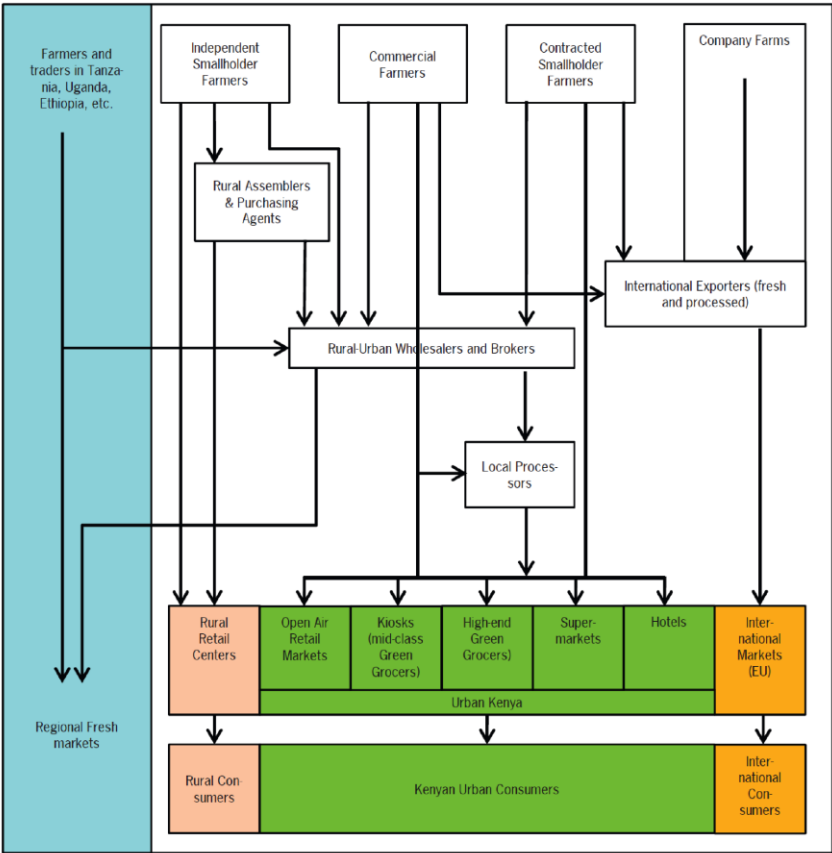
Fruit and vegetable production predominantly occurs in the areas surrounding Nairobi, Lake Naivasha, and Mount Kenya. Vegetable production for the Nairobi market takes place primarily within a radius of 150km of the city (Tschirley and Ayieko 2008). Fruit production is more dispersed, with Kisii to the west, Meru to the north, and Machakos to the east being important supply points. Potatoes and plantains are staples and act as a consumption “shock absorber” for annual variations in the production of maize (Ariga et al 2010). Given Nairobi's proximity to Tanzania, tomato production from northern Tanzania is able to compete in the Nairobi market with Kenyan production from Taita Taveta (USAID 2013). While horticulture has historically been for domestic consumption, Kenya has become one of the largest African suppliers of horticultural products to the European Union (Ouma 2010b).

7.2 Food Distribution

The vast majority of the fresh produce consumed in Nairobi is grown and marketed within Kenya. Produce flows into Nairobi from over 45 districts in the country, as well as from Tanzania, Uganda and various international sources. Inefficiencies along value chains create roles for intermediaries that drive up transaction costs and produce an inefficient post-harvest procurement and marketing network. This pushes some food products out of the reach of those who

would benefit most from increased consumption (Nyoro et al 2007, van der Lans et al 2012). Kenya’s traditional fresh fruit and vegetable marketing system is characterized by fragmentation at both the producer and the retailer ends of the supply chain. Among the difficulties are that market power resides with the wholesalers; there is little quality control and little or no product innovation; and there are small inventories (Neven and Reardon 2004).

FIGURE 14: Fresh Produce Supply Chain in Kenya



Source: van der Lans et al (2012)

Key actors in the supply chain include farmers; assemblers and wholesalers who buy bulk food products in rural areas and transport it to Nairobi; urban wholesalers operating primarily within the city; and a variety of retailers within the city selling products to consumers (van der Lans et al 2012) (Figure 14). Almost 80% of all produce from the farm gate is assembled and transported to the city by wholesalers in rural communities. Rural assembly is dispersed and only 2% of the produce flows through formal rural assembly markets. Wholesalers work with smaller assemblers and also visit farms directly. Supermarket chains play a small, though increasing, role in rural assembly as well (Tschirley and Ayieko 2008).

Produce grown outside Nairobi enters the city through co-operatives and truck transportation. Farmer associations help rural farmers secure the capital to hire truck transportation or taxi drivers to take their crops and food produce into the city (Romanik 2008). Truckload sizes vary: 40% hold one-half to two tons of produce, and another 40% hold between three and six tons. Canters, with a median load of almost four tons, make up about 65% of vehicle types transporting food into Nairobi markets (Tschirley and Ayieko 2008). Fragile food products such as tomatoes are transported almost exclusively in smaller pickup trucks that hold less than one ton.

FIGURE 15: Wakulima Market



Source: <https://www.standardmedia.co.ke/business/article/2000149863/how-nairobi-county-is-losing-millions-of-market-revenues>

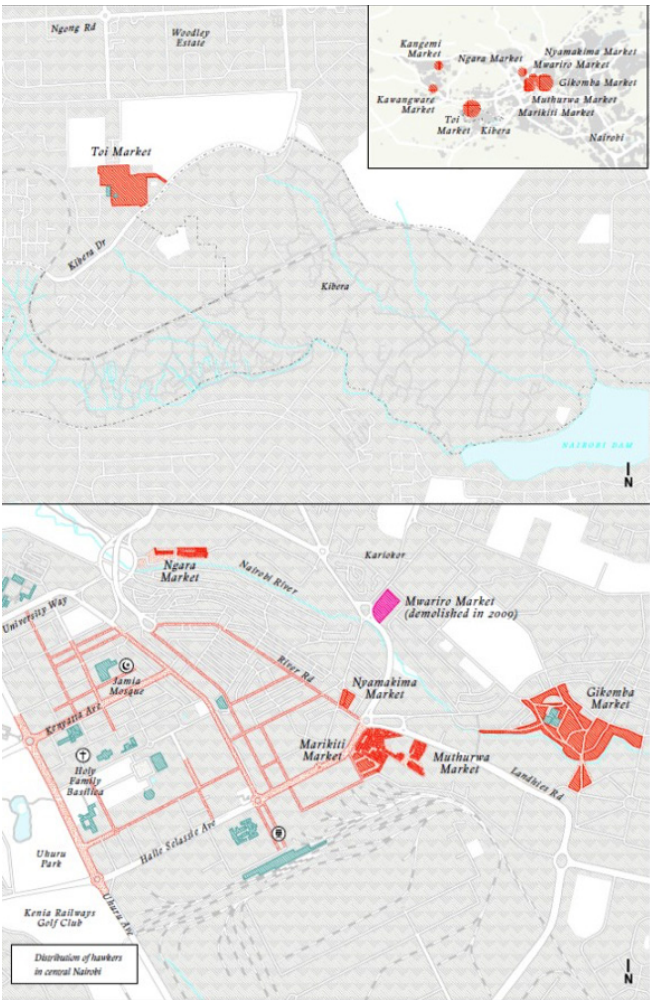
FIGURE 16: Transportation Truck at Wakulima Market



Source: <http://www.businessdailyafrica.com/image/view/-/1241266/medRes/297126/-/fnl6cez/-/dukas.jpg>

Most food products flow into one of five wholesale/retail markets before making their way to various retailers within the city. Wakulima Market has a majority share of wholesale transactions and supplies fresh fruit and vegetables to many of Nairobi’s residents, either directly or indirectly. In 2008, Wakulima handled an estimated 56% of the value and 67% of the volume of vegetables flowing into the city’s wholesale markets (van der Lans et al 2012). It had the majority share of carrots, onions, Irish potatoes, oranges, mangoes and watermelons (Tschirley and Ayieko 2008). Other prominent wholesale markets in Nairobi include Gikomba (23% of value and 16% of volume), Kangemi and Kibera. Wholesaling areas in these markets constitute an open space where produce is unloaded and moved to retail traders. Access and infrastructure problems are common and lead to substantial waiting time for wholesalers and transporters. As a result, unloading happens throughout the day and night (Tschirley and Ayieko 2008, USAID 2013).

FIGURE 17: Location of Retail Markets in Nairobi



Source: Linehan (2015)

FIGURE 18: Satellite Image of Wakulima Market

Source: Google Maps

WAKULIMA MARKET

Wakulima Market was built in the late 1960s as a city wholesale market and supplies fresh fruit and vegetables to most of Nairobi's residents. Wakulima is the most important wholesale market for horticultural products in Nairobi and also includes a retail market. It is located in the city centre forcing transporters to battle Nairobi traffic to deliver commodities. The market has two roofed areas providing shelter for traders during rain. The market place is owned by Nairobi City Council (NCC) which is in charge of collecting the market fees on a daily basis. The market authority does not perform any quality assurance or standard control of the products being sold. There are two kinds of market fees. One is the fee traders or retailers pay for market entry and their stall, the other is the fee paid by intermediaries per unit of commodities traded on the market. Those fees are important for the city council's budget. Fresh produce is usually transported at night from production areas in Kenya and the region, and arrives at the market in the early hours of the morning. Produce is usually offloaded in the dark, in designated parking zones in the market, or nearby streets, and carried in by porters to wholesalers. In many cases, the produce is sold before being offloaded from the truck, and the truck moves on to retail markets. With the growing population and increasing demand for fruit and vegetables, the market reached the limits of its capacity. Currently, approximately 3,000 wholesalers and retailers do business on a daily basis, far more than the market was designed for. Over the years the market has suffered neglect as there has been no physical expansion or infrastructure upgrades since it was built. Therefore, wholesale trade has moved partly to other retail markets in town resulting in a loss of wholesale share at Wakulima. Wholesale trade at some of these market places is set up illegally and without a licence from the NCC.

Source: van der Lans et al (2012) and USAID (2013)

Muthurwa Market, directly next to Wakulima Market, is a retail market and houses over 8,000 vendors (Ouma 2010a). Gikomba Market is also near Wakulima and emerged because of the limited space at Wakulima. The market actually developed on the streets when the traders started their business in New Pumwani and Quarry Road. This is why Gikomba has no infrastructure, no paved roads and no buildings. Gikomba does not provide adequate facilities in terms of hygiene, security and shelter against rain and sun. The traders and retailers still operate from the roadside. Wholesale trade takes place in the mornings from 4am until 8am. At 8am the wholesalers have to vacate and from then on it is used for retail activities (van der Lans et al 2012 and USAID 2013).

While Wakulima Market has historically been central in Nairobi's food distribution network, the system is becoming increasingly decentralized and dynamic. Rapid urbanization and growing populations on the periphery of the city are contributing to the decentralization of the food system (van der Lans et al 2012). The decentralization of wholesaling in Nairobi is evident when examining where retailers purchase their produce. Almost one-fifth of all produce flowing into the city goes directly to retail traders. Vegetables, and some fruits produced in peri-urban Nairobi, are commonly procured in this manner (Tschirley and Ayieko 2008). In addition, small intra-urban wholesalers procure produce from one of the main wholesale markets and move it to smaller, peripheral wholesale markets. Such second-tier wholesaling involves a substantial amount of produce. Logistically, handcarts, motorcycles, and bicycles are commonly used for intra-urban food transport. Handcarts can transport up to 400kg of food in a load (Figure 19). Some of these methods are available for hire for food delivery within the city.

FIGURE 19: Hand Cart Used for Intra-Urban Food Transport



Source: https://farm6.static.flickr.com/5293/5474353583_257bd3725c_b.jpg

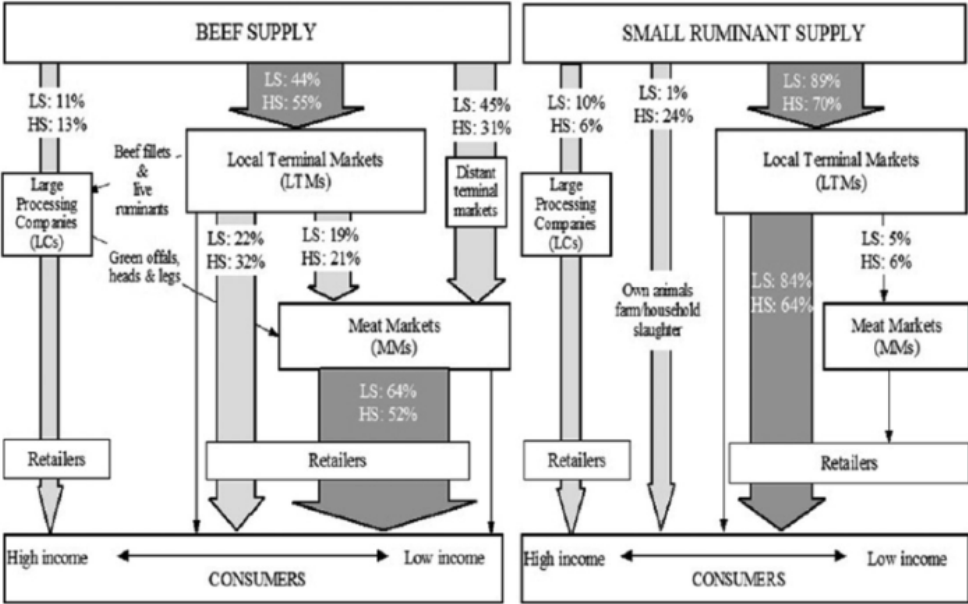
The consumption of beef, mutton and goat products in Nairobi is growing and is projected to double by 2030 (Alarcon et al 2017: 2). Nairobi has a number of meat markets and abattoirs to which livestock is brought by traders from throughout the country (Figure 20). The livestock supply chains link individual city markets to primary markets in particular parts of the country. For example, Kiserian Market obtains most of its supply from the south of Kenya, Dagoretti is linked to south-west and south-central Kenya, and Kiamaiko to the east-north of the country. Shauri Moyo obtains half of its beef from other city markets and up to a quarter from areas close to Nairobi (Alarcon et al 2017: 11). City Market sources almost all its beef from markets in and around Nairobi. Livestock is brought to the city abattoirs on the hoof or by truck and purchased by individual brokers who arrange the slaughter and distribution of products. The meat reaches retailers and the consumer via local terminal markets, meat markets and large processing companies (Figure 21). The transport of meat within the city to butcheries and other outlets is handled by motorcycles and small trucks with meat boxes.

FIGURE 20: Location of Meat Markets and Abattoirs



Source: Alarcon et al (2017: 3)

FIGURE 21: Flowchart of Meat Products to Nairobi Consumers



Source: Alarcon et al (2017: 5)

FIGURE 22: Nairobi Meat Retail Market



Source: <http://travispatti.com/2011/06/>

7.3 Food Processing

The food-processing sector in Nairobi requires further research, although some work exists on maize processing, which is of importance because maize is the primary staple food. The main maize products are maize grain (obtained by households from markets), maize meal (from grinding mills commonly referred to as posho mills), industrial and industrial fortified maize meal (sifted and pre-packaged by industrial millers) (De Groote and Kimenju 2012). Posho mills mainly sell artisanal products, while small shops and supermarkets offer industrial products. Posho mills are the major suppliers in low-income areas of the city and are generally located in or close to markets. Most consumers buy maize grain from market vendors and take it to the posho mills for processing into whole meal flour or muthokoi (degermed maize grain). They also sell maize flour from their own production, packed in unlabelled plastic bags. The industrial maize processing sector has over 30 milling companies (Bett et al 2010). The main product is industrial maize flour, which is packed in 2kg bags and sold in shops and supermarkets. A survey by De Groote and Kimenju (2012) identified nine different brands, two of which were fortified with vitamins and minerals. The main consumers of industrial maize flour reside in middle and upper-income parts of the city.

Mechanized processors source their products from small and medium farmers, informal market agreements, forward market contracts and production contracts and sell directly to supermarkets and wholesalers (van der Lans et al 2012). The most important processed fruits and vegetables for the domestic market include canned tomatoes and tomato products, canned beans, fruit juice, and sauces. There is also a smaller frozen food processing sector focused on beans, peas and potatoes (French fries or chips). Total processed fruit and vegetables totalled 400,000 tons in 2003 of which 260,000 tons was for the domestic market (van der Lans et al 2012). Livestock processing companies (LCs) in the city handle 13-14% of the overall meat supply and primarily target formal retailers and middle and upper-income consumers. The LCs have integrated slaughtering of livestock, marketing and distribution of products (Alarcon et al 2017: 4).

7.4 Formal Food Retail

The relative importance of formal and informal retail outlets in Nairobi for fresh produce is shown in Table 13. The vast majority of retail sales are by vendors at city markets and from informal street kiosks (or *kibanda*). Supermarkets and greengrocers tend to be patronized primarily by higher-income groups, but even they obtain most of their fresh produce from non-supermarket sources.

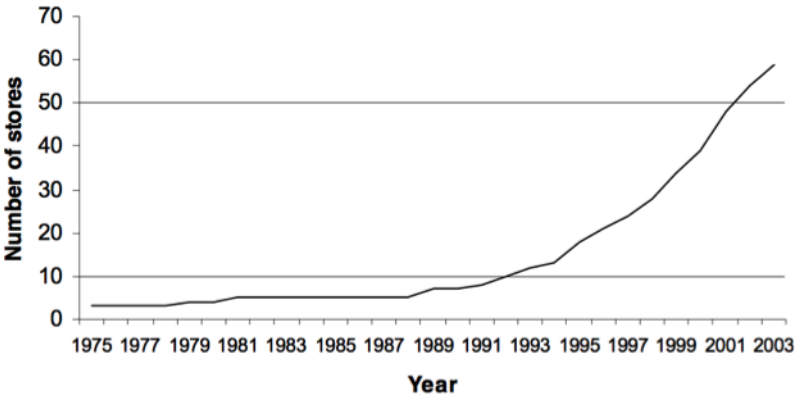
TABLE 13: Fresh Produce Market Share of Retail Outlets

Income quintiles	Super-market chains	Small super-markets	Green-grocers	Open-air markets	Roadside kiosks (kibanda)	Hawkers
1 (lowest)	0.0	0.1	0.0	64.7	41.5	3.6
2	0.0	0.0	0.0	60.6	34.4	3.7
3	0.4	0.7	0.0	60.7	36.4	1.8
4	1.7	0.1	0.0	59.5	38.0	0.4
5 (highest)	13.7	0.4	1.7	47.8	32.6	2.4

Source: van der Lans et al (2012)

The diffusion of supermarkets in cities of the Global South has potential implications for existing retail stores and informal vendors, as well as for the millions of producers and intermediary traders in supermarket supply chains, and for consumers. The “supermarket revolution” (Reardon et al 2003) has generated a great deal of research interest including in Kenya. Supermarkets occupied a tiny, specialist niche in Nairobi before the 1990s. After 1995, an 18% per year growth rate, and the continuous removal of market share from traditional retailers, meant that supermarkets had 20% of urban food retail by 2003 (Neven and Reardon 2004). However, their share of the fresh fruit and vegetable market was lower at 4% (Neven et al 2009). The supermarket revolution was graphically illustrated by Neven and Reardon (2004) who showed that the number of supermarkets in Kenya owned by the five largest chains increased from less than 10 in 1991 to over 60 in 2003. Supermarkets are emerging as key actors with real power over Kenyan urban markets and this makes them increasingly important subjects of development policy attention for government and donors focused on improving food security.

FIGURE 23: Growth of Top Five Supermarket Chains in Kenya, 1975-2003

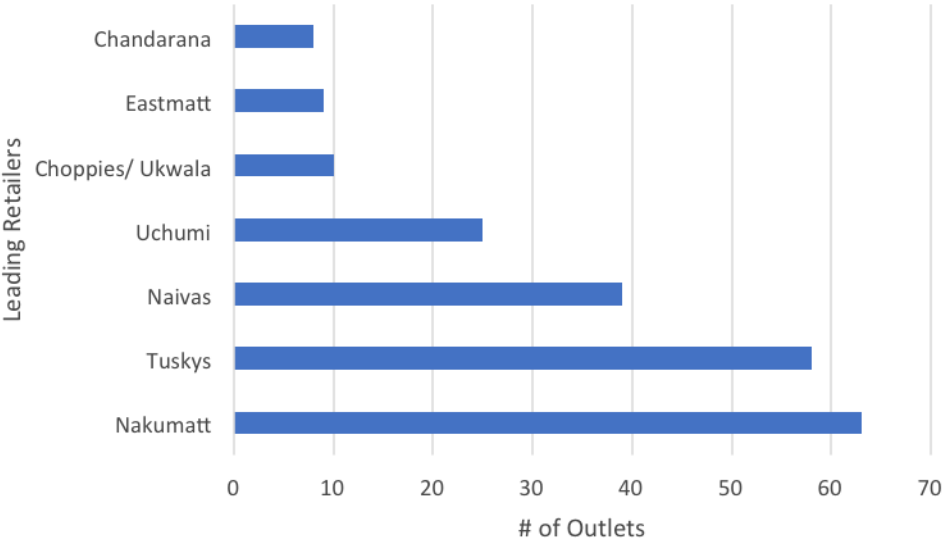


Source: Neven and Reardon (2004)

The most prominent supermarket chains in Kenya include:

- **Nakumatt:** The largest supermarket chain in Kenya, Nakumatt has 63 locations in Kenya, Tanzania, Uganda, Rwanda, and Burundi (Quartz Africa 2017). The outlets come in multiple formats such as hypermarkets, supermarkets and convenience stores. In early 2017, Nakumatt was reportedly in serious financial trouble and recently closed its operations in Uganda (Daily Nation 2017).
- **Uchumi:** Founded in 1975, Uchumi Supermarkets is a Kenyan-owned supermarket chain with locations in Nairobi and 12 other cities. It has also had financial problems, leading to down-scaling in most of its operations and the closure of some branches.
- **Tuskys:** This Nairobi-based supermarket chain was established in 1990. As of 2017, they had expanded to 58 locations in Kenya and Uganda. The outlets range in style from “mega super stores” to convenience-style shops.
- **Naivas:** Established in 1992, Naivas has 39 locations in Nairobi and eight other Kenyan cities.
- **Eastmatt:** This was established in 1990 and most of its nine branches are in Nairobi.
- **Choppies:** This Botswana-owned multinational retailer has locations in Botswana, South Africa, Zimbabwe, Zambia, Tanzania and Kenya. Ukwala supermarket in Nairobi is a subsidiary of Choppies.
- **Chandarana Food Plus:** This Nairobi-based supermarket chain has been in operation since 1964. Currently, the supermarket operates nine branches in Nairobi.

FIGURE 24: Major Supermarket Chains in Kenya, 2017

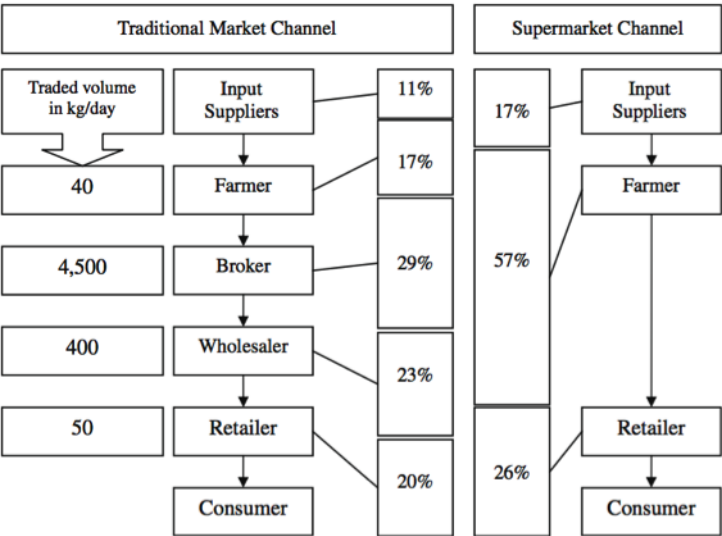


Source: Quartz Africa (2017)

South African supermarket chains that have expanded into other African countries have not penetrated the Kenyan market due to the dominance of these local chains. However, Metro Cash and Carry and Woolworths have made inroads.

The economies of scale of the supermarket chains have been sufficient for them to build their own procurement systems including distribution centres, preferred supplier contracts with farmers and specialized wholesalers, private quality standards, IT systems for product flow management and communication, shorter supply channels for perishable products and fewer (but larger) suppliers (Neven and Reardon 2004). Uchumi and Nakumatt sourced 30% of their fresh fruit and vegetables directly from producers in 1997, and 50% by 2003 (Neven and Reardon 2004). The trend towards streamlined supply chains with few intermediaries allows these retailing chains to improve consistency of supply and cut wholesaler margins (Figure 25). They have been able to drive down supply chain costs, charge lower prices and undermine traditional competitors. However, the market share of supermarkets for fresh fruit and vegetables remains small at less than 5%.

FIGURE 25: Production and Marketing Margins in Kale Supply Chains



Note: % of retail price earned
Source: Neven et al (2009)

FIGURE 26: Nakumatt Supermarket in Nairobi

Source: <http://www.kachwanya.com/wp-content/uploads/2016/01/nakumatt-elephant.jpg>

FIGURE 27: Uchumi Supermarket in Nairobi

Source: <http://kenya.blog.bg/photos/175759/original/100%20Nairobi/47.jpg>

The future development of Kenya's modern food retail sector is included in the Vision 2030 Second Medium-Term Development Plan 2013-2017 (Republic of Kenya 2013). The plan aims to develop "a formal sector that is efficient, multi-tiered, diversified in product range, and innovative". Strategies to achieve retail modernization include (a) supporting the growth in formal retail outlets, such as supermarkets, through joint and standalone domestic and foreign ventures as well as guiding policies that envision institutional reforms to lower transaction costs and strengthen domestic trade; and (b) creating retail markets to locate informal players and help them grow. The Kenyan government sees great potential for upscaling and integrating the informal sector into the formal retail economy and creating new formal job opportunities.

Altenburg et al (2016) argue that there is no comprehensive national development strategy that systematically sets out how competing objectives should be balanced and how rapidly and with which accompanying policy measures retail modern-

ization should be allowed to unfold. The Kenyan government has a laissez-faire approach towards regulatory controls on supermarket expansion, assuming that the private sector will automatically tackle the issue of urban food security. The fact that processes of retail modernization could have different impacts on different societal groups is not acknowledged. In reality, the growth of the formalized food retail sector is unlikely to increase food access for all residents of Nairobi (Neven et al 2009).

Both the rate and degree to which the modern supermarket regime will diminish informal market share in developing economies is currently contested (Crush and Frayne 2011). A growing body of literature cautions against over-optimism about the rate of supermarkets' market share accumulation and the impact their presence will have on the informal food economy (Abrahams 2009, Vink 2013). Abrahams (2009) argues that there are complexities in the relationship between the two forms of procurement and that there is a "supermarket revolution myopia" that neglects evidence of other potentially transformative processes by which the transition of food economies is made possible. Others have suggested that supermarkets have the greatest negative impact on small family-owned formal retail outlets such as butchers, grocers and general dealers (some of which call themselves supermarkets) (Crush and Frayne 2011). There is no firm evidence of impact in Nairobi and there are still significant numbers of such outlets in the city (Figures 27 and 28). The inevitability of the supermarket revolution in Nairobi needs critical evaluation, especially as some of the major chains are currently experiencing considerable financial difficulty.

FIGURE 28: Small Food Retail Outlet in Nairobi



Source: Andrea Brown

FIGURE 29: Family-Owned Supermarket in Nairobi

Source: Andrea Brown

7.5 Informal Food Sector

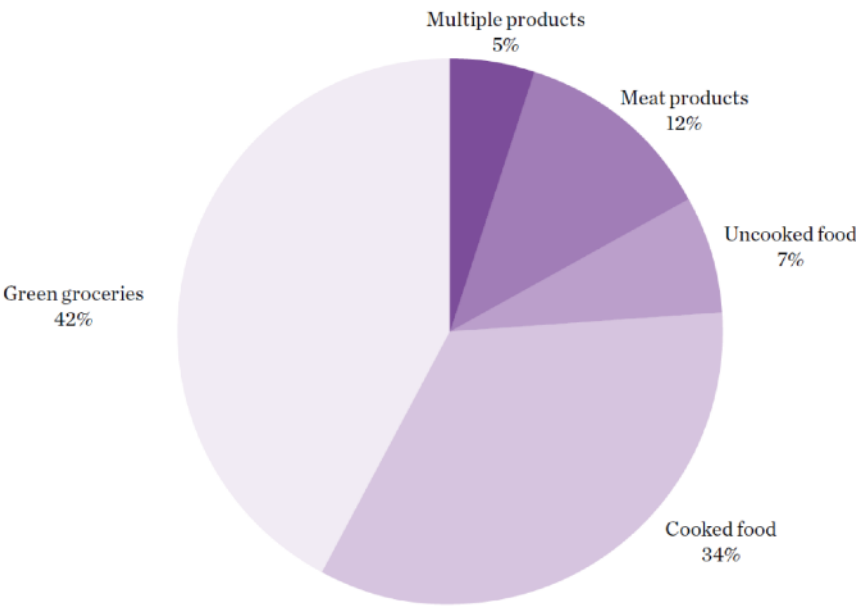
Nairobi's urban poor rely on the informal food sector for several reasons including: it provides food close to where they live and work; credit and barter are often available; small quantities can be purchased; and many items are sold more cheaply than at formal outlets (Neven et al 2006, Ouma 2010b). Strong community relationships are also associated with informal food work, particularly for women and members of shared ethnic groups (Lyons and Snoxell 2005, Macharia 1988). In Nairobi, the leading income-generating activity for women in poor communities is selling fruit and vegetables (Amenya 2007).

The informal food sector is a sub-set of the general informal sector in Nairobi (see Section 5). In Kenya as a whole, food retailing and services account for at least one-third of informal and semi-formal retail activity. The majority of Nairobi's food purchases are from informal food vendors (Tschirley et al 2010); and more than 80% of consumer food purchased in Nairobi is bought in the informal food sector (Tschirley et al 2004). In Kenya's informal food sector, the major goods traded include fruit and vegetables (31%), cooked foods and snacks (19%), and cereals and grains (6%) (UN-Habitat 2006a). In addition, there is significant informal trade in dairy, eggs and meat.

A survey of 660 vendors in Mathare, Mukuru and Kibera found that 42% were selling fruit and vegetables, 34% were selling cooked food (including githeri or maize mixed with beans, chips, beans, rice, chapatti, and mandazi or fried doughnuts), 12% meat products and 7% uncooked food (such as ngwaci or sweet potatoes, nduma or arrowroot, and cereals) (Ahmed et al 2015) (Figure

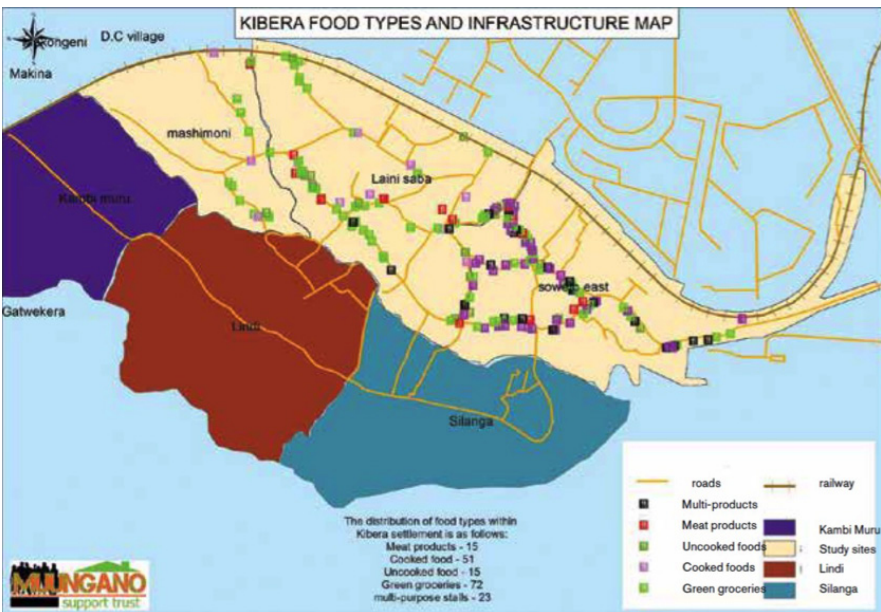
30). There was a strong link between vending and infrastructure with 82% of vendors in Kibera located within 5 metres of a road (Figure 31).

FIGURE 30: Food Types Sold by Informal Vendors in Mathare, Mukuru and Kibera



Source: Ahmed et al (2015: 18)

FIGURE 31: Location of Food Vendors in Kibera



Source: Ahmed et al (2015: 21)

Informal Vending in Mathare, Mukuru and Kibera

Although most vendors operate between 5am and 10pm, their schedules may differ based on the level of security, street lighting, available stock and customer flows in their particular villages. For instance, Mathare's villages of Kosovo and Village 4B are considered the safest, and vendors operate until approximately 11pm. Location also plays a key role in street food sales; vendors on major streets are safer and have greater customer flows compared to hawkers who operate in the inner, narrow streets. Furthermore, ethnic composition can affect levels of security and food-vending patterns. Village 4B is safe for food vendors as it is composed mainly of one ethnic group; youth groups operating in the area are acquainted with these vendors and will provide security against any external aggression. Thanks to good reticulation of electricity and street lights, Kosovo offers a safe environment for food vendors and they can operate even after 11pm. In Mukuru's village of Simba Cool, vendors again sell late at night, especially chapatti vendors who operate 24 hours a day. Competition for spaces is especially high along the main roads, since the greater volume of people there helps to increase sales of street foods. This results in conflicts among food vendors and also with owners of formal shops (if vendors sell in front of these shops). In Mathare, food vendors located in front of other shops must pay a monthly fee. In Kibera, spatial conflicts also occur between new and old vendors: every seller already has a vending site, leaving no space for newcomers.

Source: Adapted from Ahmed et al (2015: 18)

FIGURE 32: Cooked Food Street Vendor



Source: Andrea Brown

FIGURE 33: Roadside Food Vendors



Source: Andrea Brown

FIGURE 34: Informal Fruit Vendor



Source: Andrea Brown

For informal food vendors, participation in the sector provides both income and food, and thus a more consistent level of food access in contrast to non-food retail. The food retail sector frequently relies on rural food producer connections; and for recent urban migrants this allows for easy entry into the urban labour market and potentially supports both urban and rural households (Mberu et al 2013).

The informal food sector is neither isolated from or in direct competition with the formal food sector, despite its frequent portrayal as such. This reflects the broader overlap and mutual dependence of formal and informal economies in Nairobi (Rasmussen 2012). In Nairobi, considerable amounts of food sold in the informal sector originate from formal-sector wholesalers and producers (Vorley 2013). Since many formal retailers use the same sources, the overlap contributes to ambiguity in identifying economic activities as purely formal or informal (Amenya 2007). Some informal sector products are purchased from the formal sector and then re-sold in smaller quantities. The informal food sector is sometimes linked to food safety concerns related to food storage and preparation (Lagerkvist et al 2013a; Lagerkvist et al 2013b; Robinson and Yoshida 2016).

In 2013, a Food Vendors' Association was launched in four settlements: Mathare, Huruma, Mukuru and Kibera. Its over 700 members include women selling vegetables and cooked foods, butchery owners, kiosk owners and livestock keepers. Members are organized into local groups that jointly buy products as well as participate in savings schemes.

7.6 Urban Agriculture

In Nairobi, 20% of all households grow food, mostly small-scale and for subsistence (Lee-Smith 2010). Urban agriculture plays an important role in both food and nutrition security for these households, but land availability and urban livestock are the critical enabling and constraining factors. Farming plots can be found throughout the city, from backyards to common spaces to small areas in the CBD. In the 1990s, one third of these plots were privately owned (Foeken and Mwangi 1998). The majority of urban farmers grow basic staples such as maize, *sukuma wiki* (kale), tomatoes, beans, cowpeas, Irish potatoes, sweet potatoes, arrowroots and bananas. Individual yields are small due to a lack of capital, chemical inputs and proper irrigation (van der Lans et al 2012).

Rearing of livestock is common throughout the city (Lee-Smith 2010). In 2004, an estimated quarter of a million chickens and about 45,000 goats and sheep were being reared within Nairobi (Ayaga et al 2004). In 1998, there were 24,000 dairy cows within the city. Over 40 million litres of milk are produced annually in Nairobi. Rabbits are also reared for consumption in some backyards (Figure 36). Lee-Smith (2010) argues that there is a positive relationship between urban agriculture and household food security in Nairobi, with livestock providing the most value. At the household level, a study of 205 low-income households in Korogocho and Dagoretti North in 2013–2014 found that 29% kept livestock including poultry (23%) and cattle (15%) (Dominguez-Salas et al 2016). The proportion owning livestock increased with income and was more than double that of peri-urban Dagoretti. As many as 63% kept their livestock outside the

city, 34% in structures attached to the household and 3% in other parts of the city (Dominguez-Salas et al 2016: 11).

FIGURE 35: Urban Farm in Makadara, Nairobi



Source: Jeremy Wagner

FIGURE 36: Rabbit Cages in Makadara, Nairobi



Source: Jeremy Wagner

Bold claims have been made for the role and potential of urban agriculture in mitigating food insecurity in Nairobi slums. The advent of sack gardening in Kibera was hailed as an impact of food insecurity in a study comparing households that do and do not engage in this kind of gardening (Gallaher et al 2013a). There was no difference in the dietary diversity scores of the two groups of households although those with sack gardens consumed more leafy vegetables

than those that did not. There were also marginal differences in the subjective experience of food insecurity by farming and non-farming households. Overall, however, the dominant picture that emerged is the extremely high levels of food insecurity experienced by both groups of households (Table 14).

TABLE 14: Experience of Food Insecurity by Households With and Without Sack Gardens

In the previous 12 months:	Farmer %	Non-farmer %
Did you ever worry that your household would run out of food?	95	97
Were you or any household member not able to eat the kinds of food you want because of a lack of money?	91	94
Did you or any member of your household have to eat a limited variety of food due to a lack of money?	81	85
Did you or any household member have to eat less in a meal than you wanted to because there was not enough?	69	76
Did you or any household member have to reduce the number of meals eaten per day because there was not enough food?	66	76
Was there ever no food to eat in your household because of a lack of money to get food?	50	56
Did you or any household member go to sleep at night hungry because there was not enough food to eat?	42	46
Did you or any household member go a whole day and night without eating anything because there was not enough food?	20	25
<i>Source: Gallaher et al (2013: 401)</i>		

Urban agriculture might play a greater role in mitigating food insecurity if policies were better targeted at poor and marginalized households. Better-off households are able to farm more easily and efficiently than poor households because they have access to land. Poor urban households, particularly women-headed households, have less access to food and nutrition security through urban agriculture due to crowded living conditions and limited land access (Lee-Smith 2010). For urban agriculture to be as effective as possible at ensuring food security for Nairobi residents, women and poor households must be able to access its benefits. This is not the only constraint emerging within the urban agriculture debate. While urban agriculture is prevalent, there are risks of it being grown in areas that may be toxic or with inadequate storage facilities. Environmental concerns around food safety must be carefully taken into consideration.

Given the nature of farming in slum environments, farmers and consumers of food products are potentially exposed to a variety of environmental contaminants. For example, despite farmers' perceptions of minimal environmental risk, vegetables from sack gardens in the Kibera slums of Nairobi were found to have heavy metal contamination above the levels recommended for human consumption (Gallaher et al 2013b). These findings raise ethical questions about how to promote urban agriculture appropriately within Nairobi, as well as the trade-offs inherent with farming in Nairobi.

Before 2015, there was no coherent legal platform under which urban agriculture was promoted and regulated. Under Section 144 of the Local Government Act (Cap. 265), county authorities in Kenya had the power to lease, transfer or allocate land for temporary use. Section 201 also allocated power to county authorities to make bylaws necessary to maintain residents' health, safety and wellbeing, maintain good rule and government in the area, prevent and suppress nuisance, and control, regulate, prohibit or compel any act that they are empowered to perform. Nairobi City Council used these powers to enact bylaws that prohibited cultivation and the keeping of livestock on public streets (Foeken and Mwangi 1998). Section 144 (c) of the Local Government Act also prohibited cultivation by unauthorized persons on land that was not occupied or enclosed, or land belonging to private persons, government and local authorities. Section 155 (b) of the same Act, however, allowed for agricultural and livestock undertakings and the provision of services to them. Section 155 (c) also provided for the planting of famine-relief crops by persons to support themselves in any part of the country where there is likely to be a shortage of foodstuffs. Yet, in Section 157 of the Public Health Act (Cap 242), the Minister of Health was empowered to prohibit cultivation or irrigation in urban spaces. With various laws governing land use, public health and agriculture, Nairobi lacks a clear and concise vision around urban agriculture and its role.

The Nairobi City County Urban Agriculture Promotion and Regulation Bill of 2015 is an indication that the city council seeks to govern urban agriculture coherently. The objects of the Act are to (a) contribute to food security through the development of agriculture in the county by empowering the people and institutions through allowing and facilitating agricultural activities for subsistence and commercial purposes; (b) promote increased access to agricultural extension services and promote the development of people's capacities in food production, value addition, value chain development and employment creation; (c) regulate access to land and water for use in urban agriculture within the county, giving priority to residents of high density and informal settlements; (d) protect food safety, public health, and the environment by defining environmental standards for urban agriculture within the county; (e) institutionalize administrative procedures for access to agricultural resources including organic waste; (f) provide for procedures to monitor all effects of urban agriculture with regard to social, economic, and environmental conditions and allocate responsibilities to the respective county institutions; and (g) facilitate job creation in the county by encouraging agriculture as an alternative source of income. The Bill marks a shift in policy pertaining to urban agriculture. However, given that it was only recently adopted as a bylaw, its impact is yet to be seen.

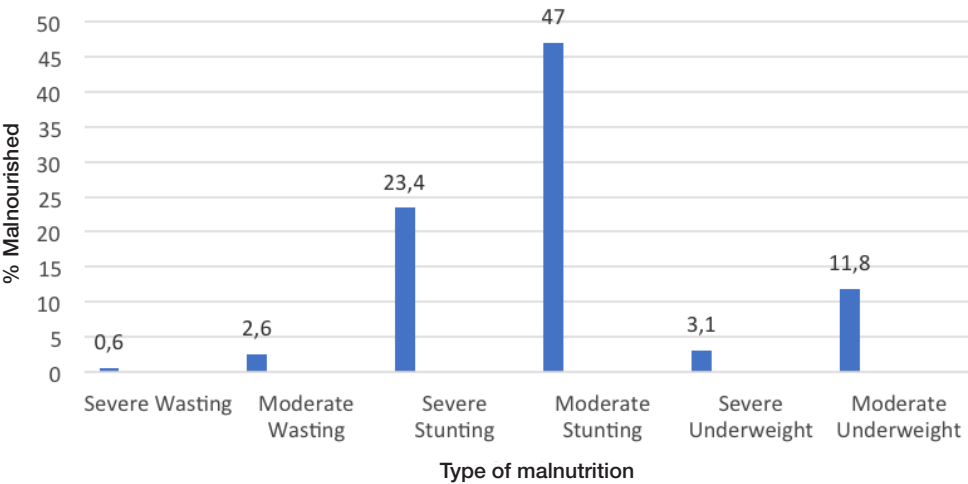
8. URBAN FOOD SECURITY

8.1 Levels and Drivers of Food Insecurity

Fifty-five percent of Nairobi's population lives in poverty (Brown 2015). These roughly 2 million people occupy five percent of the total urban residential land area and spend half their income on food. An estimated 60-70% of Nairobi's residents live in slums, characterized by inadequate sanitation and water access, and limited access to health and education services (Kimani-Murage et al 2014). All contribute to an array of negative health outcomes, including food insecurity, in the slums (Zulu et al 2011). Food is usually available "but a nutritionally adequate diet is too costly for at least one third of households" (Dixon et al 2007: 122). Residents in Nairobi slums "generally eat for bare survival, with little concern for quality" (Kimani-Murage et al 2014: 1098). In Nairobi, food security is directly tied to access, and thus to earned income. Residents who are poor are most vulnerable to food insecurity. The majority of Nairobi residents rely on precarious and low daily wages for food purchases. Within low-income groups, certain groups are most vulnerable: orphans and vulnerable children (OVC), those with low levels of education, women (particularly single household heads), the elderly, migrants, and those with precarious employment. Stability disruptions – most notably the economic and political shocks associated with the 2007/2008 Kenyan elections and global food crisis, and spikes in food prices caused by drought – have a disproportionate impact on low-income and precariously employed urban residents.

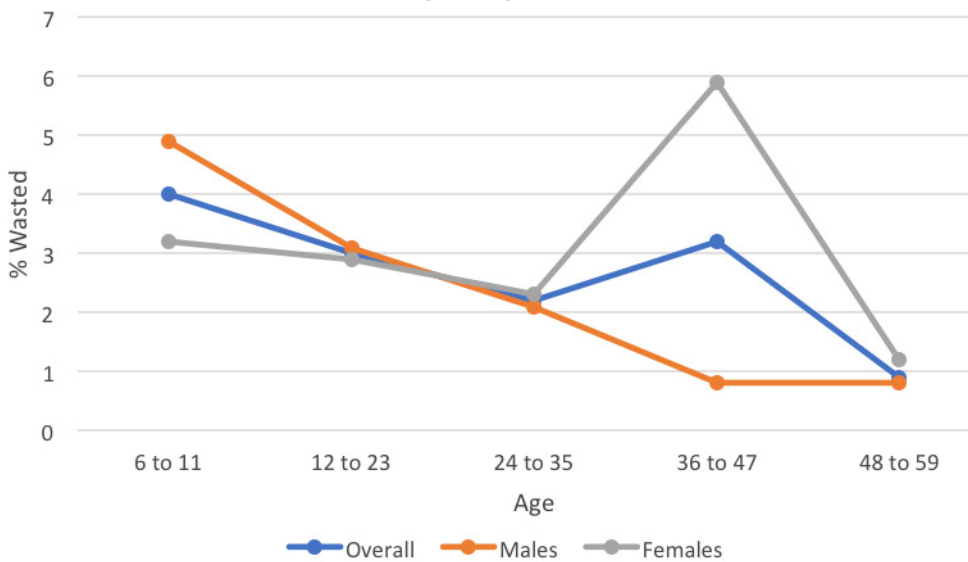
Transportation also affects consumption patterns. For example, a lack of money for transportation may impede poor consumers from purchasing a greater diversity of food items at retailers found outside of walking distance. Food shortages and food price volatility are prominent concerns within populations living in informal settlements, who already find daily food security a challenge (Olack et al 2011). Children are particularly vulnerable. Despite a decline in levels of under-five morbidity and mortality, malnutrition is still a major factor (Olack et al 2011). In Kibera, there is a high prevalence of chronic malnutrition: 47% of children under five are stunted, with 24% severely stunted (Olack et al 2011) (Figure 37). Girls tend to have higher rates of wasting than boys (Figure 38). Mutsiya (2015) found that the risk of stunting increased among children from moderately food insecure households to severely food insecure households. Dominguez-Salas et al (2016: 11) found that in Korogocho and Dagoretti, 42% of children aged 1 to 3 were stunted, with 14% severely stunted. High rates of stunting reflect "long-term problems of food insecurity, poor diets and child feeding practices, micronutrient deficiency, infectious disease load and/or enteropathy (and) inadequate water and sanitation" (Dominguez-Salas et al 2016: 15).

FIGURE 37: Prevalence of Severe and Moderate Malnutrition



Source: Olack et al (2011)

FIGURE 38: Prevalence of Wasting by Age and Sex



Source: Olack et al (2011)

In Nairobi, food consumption patterns, including dietary diversity, vary considerably. Tschirley et al (2004) note that the local diet consists of 19% dairy products, 24% meat, 25% fresh fruits and vegetables and 33% staple foods, such as maize. Yet this local diet varies with household income levels. For example, lower-income households are likely to consume less meat and dairy products and suffer from lower dietary diversity. Most households purchase their food, which means that there is a direct connection between food insecurity and income. Kamau et al (2011) carried out research in 2009 that used consumption of dietary energy and expenditure data to determine the levels of household food insecurity

in Nairobi. As total household expenditures decreased, the proportion spent on food increased. Households in the lowest expenditure quintile spent 49% of their total expenditures on food while those in the highest quintile spent only 16% on food (Table 15). Another study of four Nairobi slums found that food spending absorbed 52% of total household income and 42% of total expenditures (Amendah et al 2014: 4). Kamau et al (2011) found that 44% of low-income Nairobi households were under-nourished and 20% consumed less than 1,600 kcal of dietary energy per person per day. Households in the lowest three quintiles reported the highest percentages of those who were under-nourished and those who consumed limited daily dietary energy. The lowest-income households were becoming more food insecure (Kamau et al 2011).

TABLE 15: Comparison of Household Monthly Total and Food Expenditures, 2009

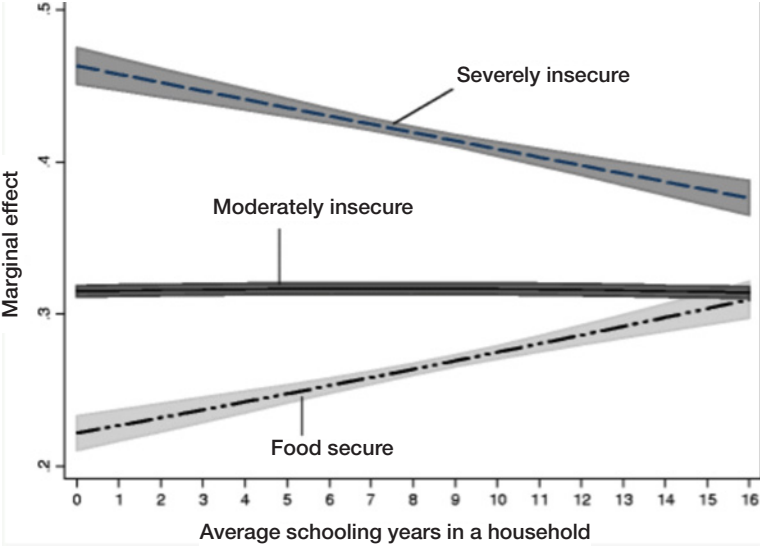
Expenditure quintile	Total expenditure	Food expenditure	Food as % of total
1 (Lowest)	13,979	6,876	49
2	19,117	8,467	44
3	25,231	10,256	41
4	40,712	13,964	34
5 (highest)	140,828	21,934	16
Average	37,380	11,155	29
<i>Source: Kamau et al (2011)</i>			

Households more likely to be food insecure are not just those with low incomes, but also those who are female-headed and/or headed by a recent migrant (Zulu et al 2011). Further, households with children under 11 or adults over 50 years old are more likely to be food insecure. OVC are particularly at risk and, in Nairobi slums, orphans are more vulnerable to food insecurity than non-orphans (Kimai-Murage 2010). Removing children from school is a coping strategy undertaken in response to food insecurity in Nairobi slums (Amendah et al 2014). Low-income children in female-headed households and/or who are OVC are most likely not to be enrolled in school.

Mutisya et al (2016) found a clear positive correlation between average years of education in a household and food security status, highlighting the long-term vulnerability of children not in school (Figure 39). They suggest that this is not simply a function of the increased earning capacity of more educated individuals and that education provides more knowledge about how to meet nutritional needs: “education, irrespective of household wealth status, has an independent effect on food security in an urban poor context.” Abuya et al (2012) also found a strong positive association between a child’s nutritional status (as measured by stunting) and the number of years of maternal education in the slum areas of Nairobi. Qualitative research reveals a keen appreciation of the root causes of child undernutrition by women of childbearing age (Goudet et al 2016).

In Korogocho and Dagoretti, Dominguez-Salas et al (2016) found that not having enough food was experienced occasionally by 29% of women and often by 30%. Two-thirds of women and 1-3-year-old children were consuming diets with recommended foods from four or more food groups. However, starchy staples were clearly the most important element of a diet with low consumption of fruit and animal-source foods (Cornelsen et al 2016). A comparison of animal-source food consumption found that in the highest income quintile, consumption was 42kg of meat, 11kg of eggs and 9kg of dairy per person per year, while the equivalent figures in the lowest quintile were 15kg, 4kg and 4kg (James and Palmer 2015: 96).

FIGURE 39: Household Food Security and Education



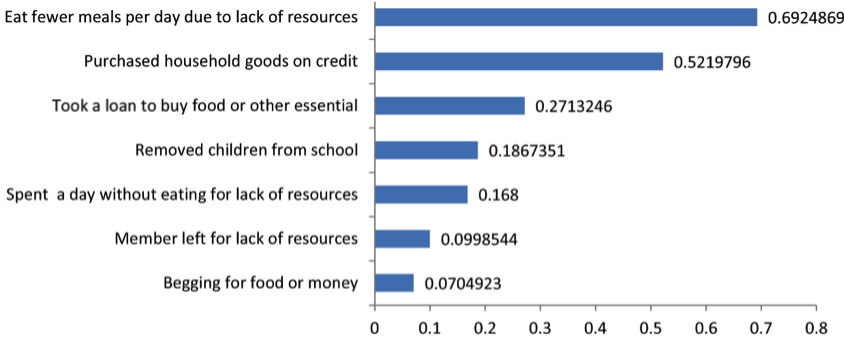
Source: Mutisya et al (2016)

Other studies provide additional insights into the food security strategies of poor Nairobi households. Hoddinott and Yohannes (2002) examined household dietary diversity and food insecurity and found that increased household dietary diversity raised household nutrition levels but required higher spending on food. Faye et al (2011) found that one in five households were food insecure and nearly half of all households showed evidence of either child or parent food insecurity, as parents often skip meals to prioritize food for their children. Amendah et al (2014) show that the most frequently used coping strategy for slum households experiencing food insecurity and/or sudden shocks was to eat fewer meals (70%), purchase on credit (52%), and borrow money to buy food (27%) (Figure 40).

Nutrition studies have begun to examine the phenomenon of the so-called double (overnutrition/undernutrition) and triple (overnutrition/undernutrition/micronutrient deficiency) burden of malnutrition in Nairobi. Kimani-Murage et al (2015) collected anthropometric data on 3,335 children and 5,190 adults in Korogocho and Viwandani and found that (a) 45% of children were stunted,

11% were underweight, 2% were wasted and 9% were overweight/obese; (b) more boys than girls were stunted, underweight and wasted; (c) children under 2 had a lower prevalence of stunting and higher prevalence of wasting and overweight than older children; (d) child stunting decreased with the age and level of education of the mother; (e) among the adults, 9% were underweight (6% of women and 11% of men), 17% were overweight (24% of women and 12% of men) and 5% were obese (10% of women and 1% of men); and (f) adult overweight/obesity increased with age and decreased with level of education. The co-existence of child undernutrition and maternal overweight/obesity in the same neighbourhood and even household was also observed: 43% of overweight and 37% of obese mothers had stunted children, for example. While this phenomenon had previously been observed in higher-income households, “current evidence indicates that it is getting even more common in lower income households” (Kimani-Murage et al 2015: 12). Dominguez-Salas et al (2016) argue that there is clear evidence of the triple burden of malnutrition with high levels of chronic malnutrition among children co-existing with high levels of maternal overweight/obesity (one-third of mothers) and low intake of essential micronutrients and high prevalence of anaemia among both.

FIGURE 40: Household Responses to Food Insecurity



Source: Amendah et al (2014)

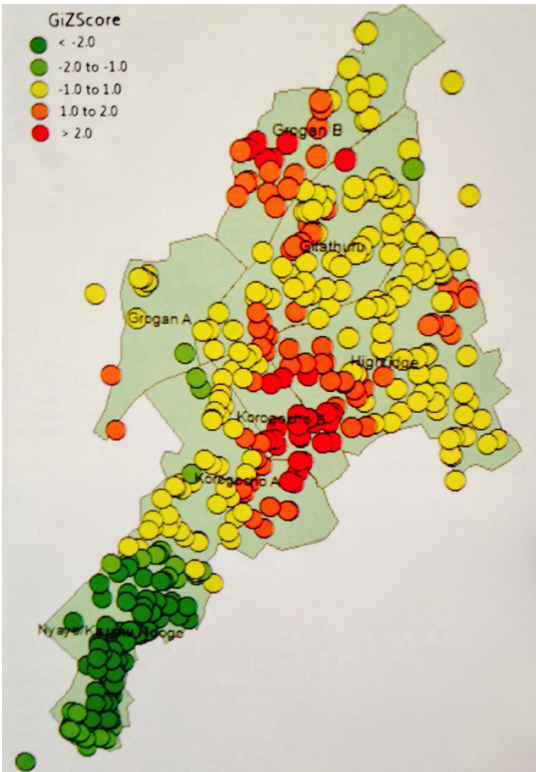
Musyoka et al (2010) report that low-income households consume significantly more maize than high-income households, while the latter consume significantly more dairy products. Maize consumption is also higher in households without a salaried employee. Recent studies have added an important spatial dimension to our understanding of food insecurity. Kimani-Murage et al (2014) look at dietary diversity and food insecurity using data from the Nairobi Urban Health and Demographic Surveillance System (NUHDSS) and food security criteria from the Household Food Insecurity Access Scale (HFIAS). The study found considerable differences in the level of food security in the two urban slums studied. In Korogocho, for example, 64% of households were severely food insecure, compared to only 33% in Viwandani. Levels of dietary diversity were low and more similar. Another comparative study of Korogocho and Darogetti (a peri-urban area with lower population density and more agricultural activities) found that the latter had consistently better food security indicators (Dominguez-Salas

et al 2016). Another study of Korogocho and Viwandani in 2011-2012 found spatial differences between these two slum areas (Mohamed et al 2016). This study of 3,210 households concluded that the source of livelihood of the main breadwinner is an important predictor of food security, and that if that individual was employed in the formal sector or owned a business, the households was more food secure. This “employment effect” was not simply about a higher and more stable source of income, but was also due to the added creditworthiness that formal employment brings. Since food is often bought on credit this becomes an important differentiating factor. In addition, as Mohamed et al (2016: 109) note:

When the breadwinner of a household is in formal employment, household members are less likely to skip a meal because of lack of food or spend a whole day without eating. These findings are significant, given the context of dominant informal employment, low wages, and the near total absence of social safety nets for vulnerable households. Because people are constantly living on the margins, minor shocks like losing employment for a short period easily result in households falling back to poverty and food insecurity.

The other major finding is the existence of intra-slum differences in levels of food insecurity and that households of similar food security tend to cluster together. This is clearly evident in Korogocho where households with higher and lower food insecurity scores are found in different neighbourhoods (Figure 41).

FIGURE 41: Distribution of Household Food Insecurity within Korogocho



Source: Mohamed et al (2016)

8.2 Food Price Increases

As noted earlier in this report, stability disruptions have a disproportionate impact on low-income and precariously employed urban residents. The rise in global food prices coincided with post-election violence in Kenya in 2007/2008, placing additional pressures on urban food security. In this period, prices of staple foods doubled even as household purchasing power was reduced due to political violence and instability. Individuals and households coped with these shocks by eating less; eating cheaper, less nutritious and less diverse food; relying more on street foods than cooking at home; and salvaging for discarded and expired foods. In 2011, Kenya faced severe drought and the government declared a national emergency. During droughts, food costs and thus access are affected, and food availability is also reduced (Kimani-Murage et al 2014). The response of the government and most humanitarian agencies focused on the Arid and Semi-Arid Lands (ASALs) in Kenya's north, despite a UNICEF analysis showing that the numbers of food-insecure children in urban areas was equal to those of the ASALs. Urban populations were dramatically affected by the spikes in food prices – admissions for treatment of severe acute malnutrition increased by 62% between January and May 2011 (Brady and Mohanty 2013). During this crisis, significant numbers of food-secure but poor populations slid into chronic poverty and faced severe food insecurity. Presently, Kenya is facing another period of drought with a corresponding drop in both availability and access to food across the country (Okiror 2017).

8.3 Food and Social Protection

Kenya's constitution commits the government to providing social security to those unable to support themselves and their dependants (Republic of Kenya 2010). Kenya's National Social Protection Policy defines social protection as "policies and actions, including legislative measures, that enhance the capacity of and opportunities for the poor and vulnerable to improve and sustain their lives, livelihoods, and welfare, that enable income-earners and their dependants to maintain a reasonable level of income through decent work, and that ensure access to affordable healthcare, social security, and social assistance" (Republic of Kenya 2012). Although this policy seeks to expand social security coverage (Republic of Kenya 2011), it fails to reach the majority of Kenya's poor and food insecure, particularly in urban centres. Government finances 55% of Kenya's social protection spending, primarily on cash transfer programmes. Development partner support covers 22% of total social protection funding, supporting safety nets primarily through relief and recovery programmes (Republic of Kenya 2012). Kenya's social protection spending is increasing, but is low by international standards.

The national government operates four targeted unconditional social cash transfer programmes, covering approximately 600,000 beneficiary households: the Orphans and Vulnerable Children Cash Transfer Programme, the Older Persons Cash Transfer Programme, the Persons with Severe Disabilities Cash Transfer Programme and the Hunger Safety Net Programme. In 2011, the government institutionalized an Urban Food Subsidy Programme. The programme only operated in Mombasa, providing 10,200 households with KES2,000 every two months. The government plans to expand the programme to Nairobi and Kisumu (Social Protection nd).

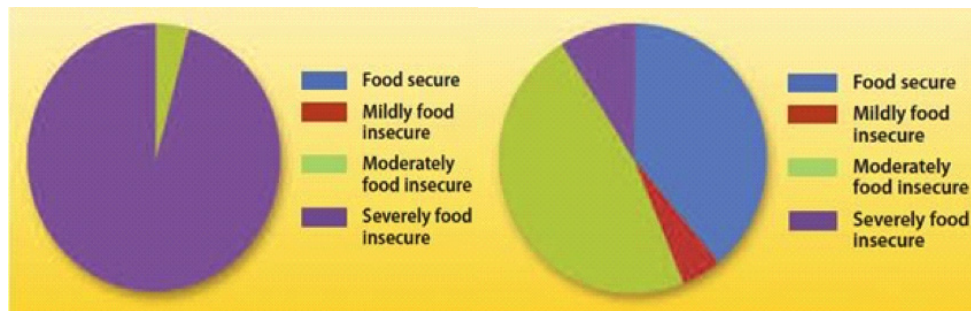
The Hunger Safety Net Programme supports populations in arid Northern Kenya. Since 2013, all social cash transfers have been delivered electronically. This has improved delivery time and accountability, but poses problems for those who do not hold national identity cards, especially child-headed households (cards are only issued to citizens 18 years or older) (Mwasiaji 2016). OVC are the central target group for Kenya's social cash transfers. The unconditional cash transfer programme for OVC provides approximately USD20 to recipient households every 60 days. It is Kenya's largest social protection programme, reaching 170,000 households as of January 2014 (Kilburn 2016). The programme defines OVC as children under 18 who have lost one or both parents, or who have one or more parent or caregiver who is chronically ill. This group is increasing in numbers, largely as a consequence of HIV and AIDS. Cash transfers to OVC promote school attendance and health service use, but are also central to supporting food security. However, most of the estimated 2.6 million OVC in Kenya do not receive this cash transfer or other support services (Lee et al 2014).

Social protection tools were introduced to address urban food security following the 2007–2008 food crisis. In January 2009, the government declared the food crisis a national disaster, estimating that 9.5 million Kenyans were at risk of starvation, with 4.1 million of these from urban informal settlements (Mohanty 2013). While the government's response focused on vulnerable groups in the north (with the Hunger Safety Net Programme), Oxfam GB and Concern Worldwide targeted urban residents with a three-year cash transfer and skills development project in the Mukuru and Korogocho informal settlements. The main beneficiaries were OVC and their caregivers, the elderly, and people with HIV and AIDS and other chronic conditions. Cash transfers of KES1,500 (USD12.50) per month were provided through mobile money transfers (MPESA). This project saw substantive improvements in household food security for recipients.

In addition to these two targeted cash transfer programmes, Kenya's Youth Enterprise and Development Fund (YEDF) was introduced in 2006 to address youth unemployment by financing youth enterprises thorough microcredit. Like microcredit generally, loans are too small to allow for savings and most businesses invested in are informal and generate low returns. However, a 2014 study of

YEDF impacts in Nairobi found that recipients experienced small but positive improvements in their food security, although not significant enough to impact dietary diversity (Wafula 2014).

FIGURE 42: Household Food Security at Beginning and End of Intervention



Source: Mohanty (2013)

9. CONCLUSION

Most of the evidence relating to food insecurity and its relationship to the food system in Nairobi is based on case studies in low-income parts of the city. The Hungry Cities Partnership has therefore conducted a city-wide survey of household food security and food sourcing patterns. The survey results will be published in a forthcoming HCP Report, which will add considerably to the picture painted in this report and provide a more nuanced, city-wide picture of Nairobi's food system and the governance challenges it poses.

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Nairobi is a city of stark contrasts. Nearly half a million of its three million residents live in abject poverty in some of Africa's largest slums, yet the Kenyan capital is also an international and regional hub. In East Africa, rapid urbanization is stretching existing food and agriculture systems as growing cities struggle to provide food and nutrition security for their inhabitants. Nairobi is no exception; it is a dynamically growing city and its food supply chains are constantly adapting and responding to changing local conditions. It is also an international city and the extent to which it is food secure is increasingly predicated on food imports from the regional East African Community and other international sources. Informal traditional value chains have a variety of actors and intermediaries that increase transaction costs and create an inefficient post-harvest procurement network, thereby pushing food products out of the reach of those who need them most. The majority of Nairobi's food purchases are from informal food vendors. The city's urban poor rely on the informal food sector for several reasons including that it provides food close to where they live and work, credit and barter are often available, small quantities can be purchased, and many items are sold more cheaply than at formal outlets. The leading income-generating activity for women in Nairobi's poor communities is selling fruit and vegetables.

